



ENERGY MANAGEMENT SOFTWARE

POWERSTUDIO

(Standard, SCADA, Deluxe)

Version 3.4

USER MANUAL 4 / 4

(M98232101-03-12B)

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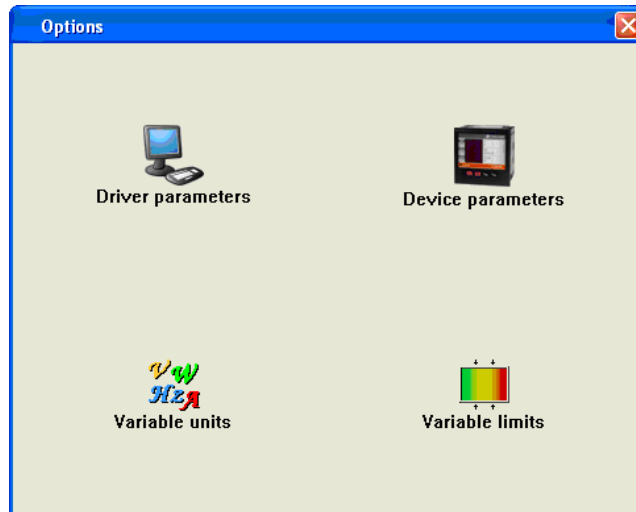
1 Devices

1.1 Drivers Options Configuration

Device options may be accessed from

- *View Menu*: Refer to 'Editor manual'.
- *Toolbar*: Refer to 'Editor manual'.

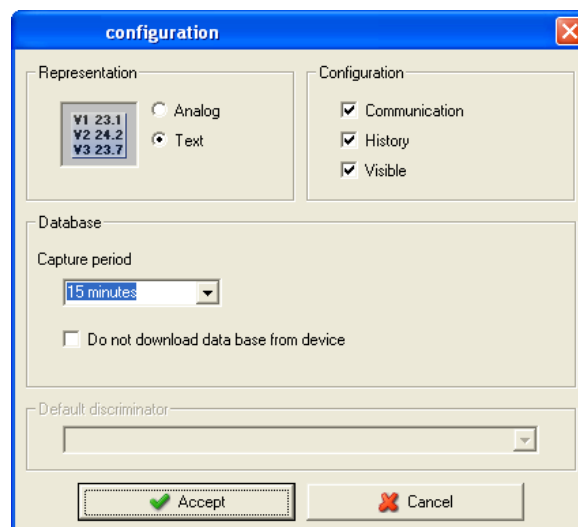
The options menu for a CVM-96 device will be the following



In this section those options which are common to all or the majority of the drivers are described.

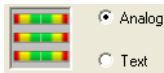
These options are described using the CVM-96 device as an example. It is possible that other devices need to configure other types of options, which are not described in this section, in which case detailed explanation will be contained in the corresponding device section.

1.1.1 Driver Parameters

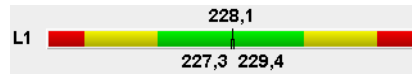


From this screen we can configure the variable display type on screen and configure where to save the data files.

There are two types of data representation.



Analogue representation, the variables are graphically represented by bars as

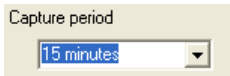


Where instantaneous value, maximum and minimum values are represented.

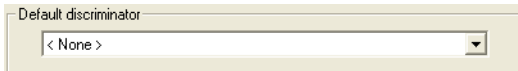


Text mode representation, the variables are represented as

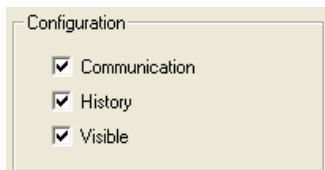
Phase-neutral (V)	228,2	229,6	229,7
-------------------	-------	-------	-------



The capture period is entered into this field. This indicates the time interval which elapses between the device history recordings. The periods permitted are 10, 15, 20 and 30 seconds, 1 minute and multiples up to a maximum of 60 minutes.



This selector will assign a default filter to the device. This option appears only in those devices possessing variables that can be filtered. If we select a filter, when making graphs or tables, the variables are displayed initially as filtered, although it is also possible to see the variables without the filter, or see them through a filter other than the default one.



Using we can activate or deactivate communication with a device, decide whether or not to save device histories and whether or not to allow a user to see a device from the client.

1.1.2 Variable Units

The 'Unit configuration' dialog box is organized into a 3x3 grid of sections. Each section contains two columns: 'Units' and 'Accuracy'. The 'Units' column typically has two radio button options, and the 'Accuracy' column has three radio button options. At the bottom, there are 'Accept' and 'Cancel' buttons.

Section	Units	Accuracy
Voltage	<input type="radio"/> kV <input checked="" type="radio"/> V	<input type="radio"/> Without decimals <input checked="" type="radio"/> 1 decimal
Frequency	<input type="radio"/> Hz	<input type="radio"/> Without decimals <input checked="" type="radio"/> 1 decimal
Distortion	<input type="radio"/> %	<input type="radio"/> Without decimals <input checked="" type="radio"/> 1 decimal
Current	<input type="radio"/> kA <input checked="" type="radio"/> A	<input type="radio"/> Without decimals <input checked="" type="radio"/> 1 decimal <input type="radio"/> 2 decimals <input type="radio"/> 3 decimals
Active / apparent power	<input type="radio"/> MW / MVA <input checked="" type="radio"/> kW / kVA	<input type="radio"/> Without decimals <input checked="" type="radio"/> 1 decimal <input type="radio"/> 2 decimals <input type="radio"/> 3 decimals
Reactive power	<input type="radio"/> MvarC / MvarL <input checked="" type="radio"/> KvarC / KvarL	<input type="radio"/> Without decimals <input checked="" type="radio"/> 1 decimal <input type="radio"/> 2 decimals <input type="radio"/> 3 decimals
Active energy	<input type="radio"/> MWh <input checked="" type="radio"/> kWh	<input type="radio"/> Without decimals <input checked="" type="radio"/> 1 decimal <input type="radio"/> 2 decimals <input type="radio"/> 3 decimals
Reactive energy	<input type="radio"/> MvarCh / MvarLh <input checked="" type="radio"/> kvarCh / kvarLh	<input type="radio"/> Without decimals <input checked="" type="radio"/> 1 decimal <input type="radio"/> 2 decimals <input type="radio"/> 3 decimals
Harmonics	<input type="radio"/> %	<input type="radio"/> Without decimals <input checked="" type="radio"/> 1 decimal

Use this dialogue to configure units and the number of decimals with which to display the variables on screen. This type of configuration only affects the value display on the screen and does not affect the equipment.

This is a smaller version of the 'Unit configuration' dialog box, specifically for 'Current'. It shows the 'Units' section with ☐ kA and ☒ A, and the 'Accuracy' section with ☐ Without decimals, ☒ 1 decimal, ☐ 2 decimals, and ☐ 3 decimals.

This is a smaller version of the 'Unit configuration' dialog box, specifically for 'Units'. It shows the 'Units' section with ☐ kA and ☒ A.

The units in which the variables are shown are selected. In this case all the current variables will appear in A.

This is a smaller version of the 'Unit configuration' dialog box, specifically for 'Accuracy'. It shows the 'Accuracy' section with ☐ Without decimals, ☒ 1 decimal, ☐ 2 decimals, and ☐ 3 decimals.

The precision when displaying the variables is selected. In this case all the current variables are shown with 3 decimals.

1.1.3 Variable limits

The 'limits setup' dialog box is used to configure nominal variable values and alarm margins. It includes sections for various electrical parameters, each with fields for Alarm, Prealarm, and Nominal values, and units in brackets. The 'Accept' button is highlighted with a green checkmark, and the 'Cancel' button has a red X.

Use this dialogue to configure nominal variable values, as well as a series of margins to display on screen when a variable measures unusual values.

Phase-neutral voltage

Alarm	Prealarm	Nominal	Prealarm	Alarm
50	25	230	25	50

Minimum (%) (V) Maximum (%)

Nominal: 230 (V)

Nominal variable value. The units used to express this value are indicated in brackets. If the nominal value is 0, the alarm is disabled. For the power factor, the nominal value should be 1 to enable the alarm or 0 to disable it.

Alarm	Prealarm
50	25

Minimum (%)

Percentage of nominal value for the pre-alarm or alarm signal. In this case when the variable value is between 25% and 50% below the nominal value, there will be a pre-alarm signal, if it is below 50% the alarm will sound. For the power factor the desired alarm and pre-alarm between +0.0 and -0.0 are entered directly.

Prealarm	Alarm
25	50

Maximum (%)

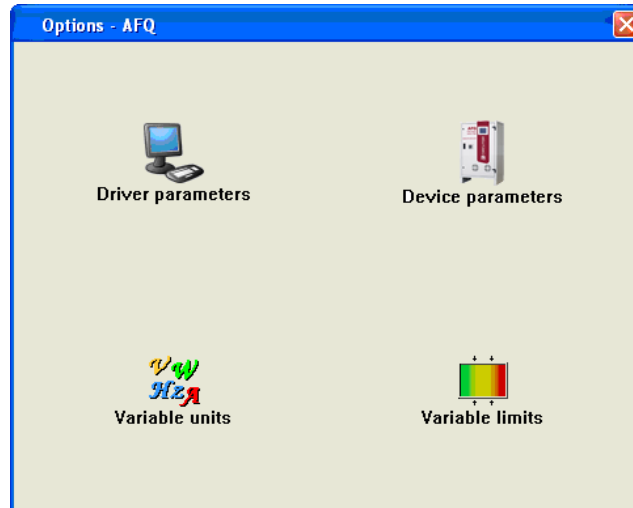
Percentage of nominal value for the pre-alarm or alarm signal. In this case when the variable value is between 25 and 50% above nominal value, there will be a pre-alarm signal, if it is above 50% the alarm will sound. For the power factor the desired alarm and pre-alarm between +0.0 and -0.0 are entered.

If the pre-alarm value is equal to the alarm value, the pre-alarm zone will be disabled, passing directly from the normal state to the alarm status.

1.2 AFQ (Active filter)¹

1.2.1 Driver options

Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.2.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

Device Information		
Peripheral number	Model	Serial number
2	AFQ (Filtro Activo)	0
Identifier	Version	Gamma
AFQ	0	0
Description		

Filter Status: Control algorithm:

Transformation ratio of transformer of charge measurement current: / 5

Operating mode:

<input type="checkbox"/> Harmonic filtering	<input checked="" type="checkbox"/> Balanced phase
<input checked="" type="checkbox"/> Reactive compensation	<input type="checkbox"/> Priorities

Selected filters:

<input type="checkbox"/> Harmonic 3	<input checked="" type="checkbox"/> Harmonic 5	<input checked="" type="checkbox"/> Harmonic 7	<input type="checkbox"/> Harmonic 9
<input checked="" type="checkbox"/> Harmonic 11	<input type="checkbox"/> Harmonic 13	<input type="checkbox"/> Harmonic 15	<input type="checkbox"/> Harmonic 17
<input type="checkbox"/> Harmonic 19	<input type="checkbox"/> Harmonic 21	<input type="checkbox"/> Harmonic 23	<input type="checkbox"/> Harmonic 25

Minimum load current to start the filter: A

Number of AFQ's installed in parallel:

¹ Only in version 3.3 or greater

Device Information		
Peripheral number	Model	Serial number
2	AFQ (Filtro Activo)	0
Identifier	Version	Gamma
AFQ	0	0
Description		

Displays general information about the device.

Filter Status

ON

Displays the filter status, (ON/OFF); this field cannot be edited.

Control algorithm

Temporal method

Displays the control algorithm, there are two options (*Frequency method* or *Temporal method*); this field cannot be edited.

Transformation ratio of transformer of charge measurement current

0 / 5

Displays the transformation ratio for the load current measurement transformer; this field cannot be edited either.

Operating mode

☐ Harmonic filtering
 ☒ Balanced phase
 ☒ Reactive compensation
 ☐ Priorities

Configuration of the operating mode; the four modes can be selected at the same time.

Selected filters

☐ Harmonic 3
 ☒ Harmonic 5
 ☒ Harmonic 7
 ☐ Harmonic 9
 ☒ Harmonic 11
 ☐ Harmonic 13
 ☐ Harmonic 15
 ☐ Harmonic 17
 ☐ Harmonic 19
 ☐ Harmonic 21
 ☐ Harmonic 23
 ☐ Harmonic 25

Option for selecting harmonics in the selective filtration.

Minimum load current to start the filter

17 A

Displays the minimum load current to start the filter.

Number of AFQ's installed in parallel

2

Displays the number of AFQs installed in parallel; the value must be between 1 and 8, inclusively.

1.3 C-14d

1.3.1 Driver options

Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

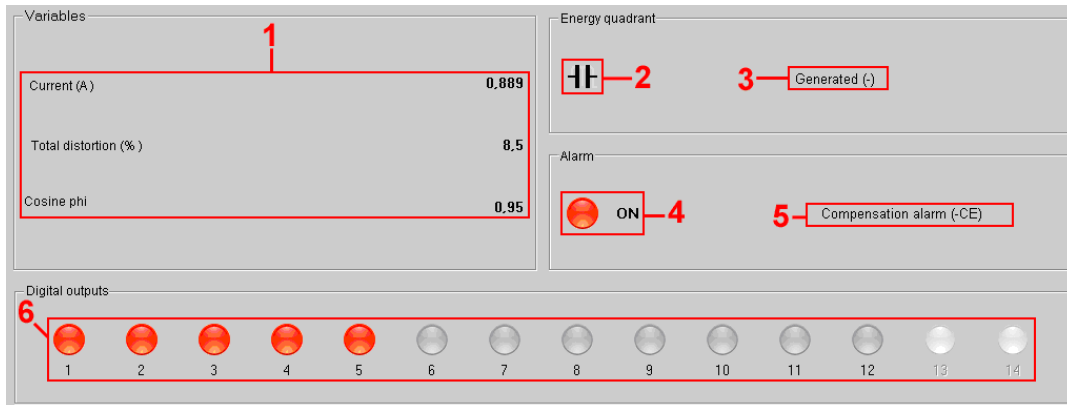
1.3.1.1 Device parameters

In the case of C-14d it will not be possible to configure any parameters of the device, only information about it will be shown.









Device Information	
Peripheral number	Model
90	C-14d
Identifier	Version
C14d	3
Description	
Transformation ratio	
Current	Primary / Secondary
5	5
Setup	
First capacitor current (A)	Disconnection time (s)
1	50
Cos setpoint	Connection time (s)
1	10
Distortion factor (%)	Capacitors number
0	10
Voltage phase	Connection sequence
t-2	1.1.1
<input type="button" value="Accept"/> <input type="button" value="Cancel"/>	

1.3.2 Displaying values

The C-14d device will show the following values screen:



Where:

1. Instant values measured by the device
2. Energy quadrant
 -  Inductive
 -  Capacitive
 -  Cos Phi = 1
3. Description that indicates if the energy is consumed or generated.
4. Alarm status:
 -  Status OFF. Alarm disabled
 -  Status ON. Alarm enabled.
5. Description of the enabled alarm. Will not appear if no alarms are enabled.
6. Status of the output relays:
 -  Relay disconnected.
 -  Relay connected.
 -  Relay disabled. The relay is not used by the device.

1.4 IP Camera



The IP Camera device only allows a captured image to be displayed, either by connecting directly with a camera with an Ethernet connection, a video recorder to which petitions can be made or webcams.

It will not be possible to record, display recordings or carry out any other action on the image displayed, such as motion detection, from the sources described above.

The IP Camera device can display images generated from different sources (IP cameras, videos, webcams, etc.), provided web requests can be made to these sources and the response is a still image in JPEG format or video streaming MJPEG format.

1.4.1 Adding an IP Camera

For more information on how to add a device refer to 'Editor Manual'. The following parameters are used to configure communication with an IP camera device.

- **Name:** Alphanumeric field that uniquely identifies the device throughout the program. There are no two devices in the configuration with the same name.
- **Description:** Enter a brief description of the device using alphanumeric type data.
- **IP Address:** Corresponds to the address through which the program can communicate with the device. This parameter can be an IP address or a name.
- **Port:** Corresponds to the communications port.
- **Type:** Type of image returned by the device. Video may be displayed in either MJPEG format or still picture
- **Refresh each image:** Only used for fixed images; dictates how often in seconds the program should request a new image.
- **Route/Request:** Corresponds to the request that must be made to the device to obtain the video or image requested.

- **Search:** By clicking on this button, the program will try to find the device at the address and port configured, using the most frequent routes / requests.



For more information on which route or request should be used, consult the device manual or contact your distributor.

1.5 CBS-4 /CBS-4 RA

1.5.1 Driver options

Options menu:



1.5.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. Upon opening the dialogue box, the software will read the device configuration. When complete, click on 'Accept' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

1.5.1.1.1 CBS-4

 A screenshot of the 'CBS-4 configuration' dialog box. It has a blue title bar with a close button. The main area is divided into several sections:

- Device Information:** A table with fields for Peripheral number (60), Identifier (CBS-4), Description, Model (CBS-4), and Version (1.1).
- Configure prealarm:** A section with a 'Prealarm threshold (%)' dropdown menu set to 70.
- Operating system frequency:** Radio buttons for 50 Hz (selected) and 60 Hz.
- Channel 1 | Channel 2 | Channel 3 | Channel 4:** A tabbed interface with 'Channel 1' selected.
- Channel 1 settings:**
 - Description:** A text input field.
 - Trigger current (A):** A dropdown menu set to 0.3.
 - Trigger delay (s):** A dropdown menu set to Instantaneous.
 - Trigger coil output polarity:** Radio buttons for Standard (selected) and Positive.
 - Enable reclosing:** An unchecked checkbox.

 At the bottom, there are two buttons: 'Accept' with a green checkmark icon and 'Cancel' with a red X icon.

 A screenshot of the 'Device Information' section from the CBS-4 configuration dialog box. It shows a table with the following data:

Device Information	
Peripheral number	60
Model	CBS-4
Identifier	CBS-4
Version	1.1
Description	

Displays general information about the device.

Configure prealarm

Prealarm threshold (%)

70

Equipment pre-alarm threshold. This can vary between 50 and 100% of the device channels minimum trigger threshold.

Operating system frequency

☒ 50 Hz

☐ 60 Hz

Enables selection of the device connection working network frequency.

Channel 1 | Channel 2 | Channel 3 | Channel 4

Description

Trigger current (A)

0,3

Trigger delay (s)

Instantaneous

Trigger coil output polarity

☒ Standard

☐ Positive

☐ Enable reclosing

Displays the channel configuration.

As it is only possible to display the configuration of one channel at a time, click on one of the channels to display the corresponding configuration.

Description

Alphanumeric type information where a brief description of the channel can be entered for easy identification.

Trigger current (A)

0,3

Indicates the maximum current that can be reached by the device before triggering. The values that can be acquired are:

Disabled	0.03 (A)	0.1 (A)
0.3 (A)	0.5 (A)	1 (A)
3 (A)	5 (A)	10 (A)
30 (A)		

Trigger delay (s)

Instantaneous

Channel delay time , the possible values are:

Instantaneous:	Selective	20 ms
100 ms	200 ms	300 ms
400 ms	500 ms	750 ms
1s	3s	5s
10s		

Trigger coil output polarity

☒ Standard

☐ Positive

Configuration of the polarity of the output relay of the relay output trigger coil, allowing one of the two options possible to be selected (standard or positive).

☐ Enable reclosing If this option is selected, when triggering takes place, the device will try to reconnect the channel.

1.5.1.1.2 CBS-4 RA

CBS-4 configuration

Device Information

Peripheral number

41

Model

CBS-4 RA

Identifier

CBS-4 RA

Version

1.1

Description

Configure prealarm

Prealarm threshold (%)

70

Operating system frequency

☒ 50 Hz

☐ 60 Hz

Channel 1Channel 2Channel 3Channel 4

Description

Reconnection sequence

6 - 8" (1), 16" (1), 16" (1), 59" (1), 115" (1), 224" (1) - 900'

Trigger current (A)

0.3

Trigger coil output polarity

☒ Standard

☐ Positive

Trigger delay (s)

Instantaneous

Accept

Cancel

Device Information

Peripheral number

41

Model

CBS-4 RA

Identifier

CBS-4 RA

Version

1.1

Description

Displays general information about the device.

Configure prealarm

Prealarm threshold (%)

70

Equipment pre-alarm threshold. This can vary between 50 and 100% of the device channels minimum trigger threshold.

Operating system frequency

☒ 50 Hz

☐ 60 Hz

Enables selection of the device connection working network frequency.

Channel 1Channel 2Channel 3Channel 4

Description

Reconnection sequence

6 - 8" (1), 16" (1), 16" (1), 59" (1), 115" (1), 224" (1) - 900'

Trigger current (A)

0.3

Trigger coil output polarity

☒ Standard

☐ Positive

Trigger delay (s)

Instantaneous

Displays the channel configuration.

Channel 1Channel 2Channel 3Channel 4 As it is only possible to display the configuration of one channel at a time, click on one of the channels to display the corresponding configuration.

Description

Alphanumeric type information where a brief description of the channel can be entered for easy identification.

Trigger current (A)

Indicates the maximum current that can be reached by the device before triggering. The values that can be acquired are:

Disabled	0.03 (A)	0.1 (A)
0.3 (A)	0.5 (A)	1 (A)
3 (A)	5 (A)	10 (A)
30 (A)		

Trigger delay (s)

Channel delay time , the possible values are:

Instantaneous:	Selective	20 ms
100 ms	200 ms	300 ms
400 ms	500 ms	750 ms
1s	3s	5s
10s		

Trigger coil output polarity
☒ Standard
☐ Positive

Configuration of the polarity of the output relay of the relay output trigger coil, allowing one of the two options possible to be selected (standard or positive).

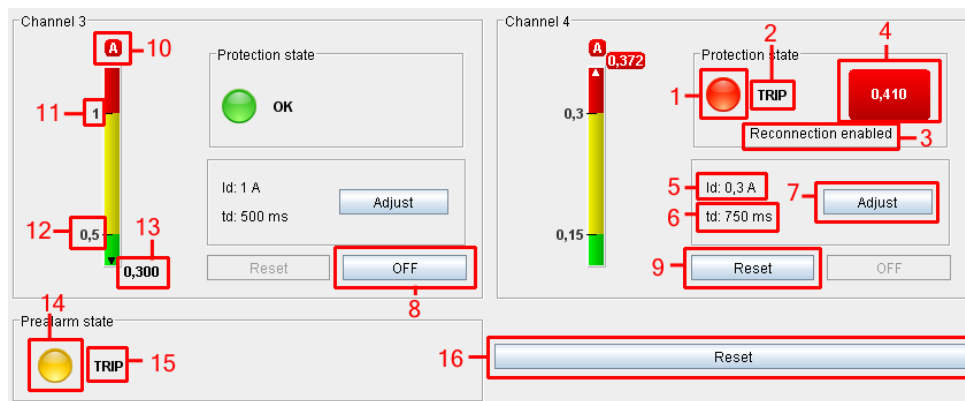
Reconnection sequence

Enables selection of the channel reconnection sequence. The information displayed will be xx – yy – zz where xx corresponds to the number of reconnections, yy to the time sequence and zz to the reset time.

1.5.2 Displaying values



Where:





1. Relay status:

- Correct
- Tripped.

2. Protection status:

- Correct. Channel not tripped
- Toroid error. An error has been detected in the connection with the toroid coil.
- Trip. Channel tripped

3. Reconnection enabled. Reports that channel reconnections have been enabled.

4. Differential current value detected when the channel triggers. If the value detected is twice the trigger threshold configured it is shown in purple.
5. Trigger current configured
6. Delay time configured
7. Adjustment button. Enables programming of sensitivity and channel delay.
8. OFF button. External disconnection of the channel. The button will remain disabled if the channel has been triggered.
9. Reset button. Push the button to restart the channel. The button will remain disabled if the channel has not triggered.
10. Current value display units.
11. Channel trigger threshold value configured
12. Channel pre-alarm value configured
13. Channel Instantaneous differential current value. When the channel instantaneous differential current value exceeds the limits of the values bar, either by excess or default, it will be indicated as shown in the figure (arrow in the bar).
14. Pre-alarm status:
 -  Disabled status.
 -  Triggered status.
15. Additional information on the status of the pre-alarm.
16. Reset button. Resets all the device channels that are triggered.

1.6 CBS-8

1.6.1 Driver options

Options menu:



1.6.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

CBS-8 configuration

Device Information

Peripheral number 2	Model CBS-8
Identifier CBS-8	Version 5.60
Description	

Device

☒ Enable reclosing

Configure prealarm

Type of prealarm relay

☒ Normally open

☐ Normally closed

Prealarm threshold (%)

90

Defined values

Current (A)

0

Delay time (s)

0

Channel 1 | Channel 2 | Channel 3 | Channel 4 | Channel 5 | Channel 6 | Channel 7 | Channel 8

Channel 1

Description

Channel 1

Type of relay output

☐ Normally open

☒ Normally closed

Type of toroid

30 mA ... 6A (WG/WGS)

Number of reclosures

0

Trip threshold (A)

0,05

Time between reclosing (s)

1

Delay time (s)

Instantaneous

Type of time between reclosing

☐ Normal

☒ Exponential


PowerStudio

Device Information	
Peripheral number	Model
2	CBS-8
Identifier	Version
CBS-8	5.60
Description	

Shows general information.

Device

☒ Enable reclosing

 Synchronise clock

This selector allows the equipment to have the channel reconnections enabled or not. Depending on whether the reconnections of the configuration fields of the channels are enabled or not. Clicking on the button '*Synchronise clock*' the present time will be sent to the PC.

Configure prealarm

Type of prealarm relay

☒ Normally open
 ☐ Normally closed

Prealarm threshold (%)

90

The following can be configured:

- *Type of pre-alarm relay*. Operation method of the pre-alarm relay common to all channels of the device.
- *Pre-alarm threshold*. Pre-alarm threshold the equipment possesses. This can vary between 50 and 100% of the minimum trigger threshold of the device channels.

Defined values

Current (A)

0

Delay time (s)

0

A trigger threshold and a personalized delay time can be configured by the user. These parameters are common to all channels of the device. Depending on the type of channel selected, the customized threshold may be selected or not.

Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7	Channel 8
Description		Type of relay output					
Channel 1		<input type="radio"/> Normally open <input checked="" type="radio"/> Normally closed					
Type of toroid		Number of reclosures					
30 mA ... 6A (W/G/W/GS)		0					
Trip threshold (A)		Time between reclosing (s)					
0.05		1					
Delay time (s)		Type of time between reclosing					
Instantaneous		<input type="radio"/> Normal <input checked="" type="radio"/> Exponential					

Shows the channel configuration.

Channel 1 | Channel 2 | Channel 3 | Channel 4 | Channel 5 | Channel 6 | Channel 7 | Channel 8 | As it is only possible to display the configuration of one channel at a time, click on one of the channels to display the corresponding configuration.

Description
Channel 1 Alphanumeric type information where a brief description of the channel can be entered to for easy identification.

Type of toroid
30 mA .. 6A (WG/WGS) Toroid type connected to the channel. There are three possible options for selection:

- Channel disabled
- Fullscale channel with 6A (30mA .. 6A)
- Fullscale with 60A (300mA .. 60A)

Trip threshold (A)
0,05 Channel trigger threshold, depending on the type of toroid connected the values available will be:

Toroid 30 mA 6... A		Toroid 300 mA 60A ...	
30 mA	1 A	300 mA	10 A
50 mA	1.5 A	500 mA	15 A
100 mA	2 A	1 A	20 A
200 mA	2.5 A	2 A	25 A
300 mA	3 A	3 A	30 A
400 mA	3.5 A	4 A	35 A
500 mA	4 A	5 A	40 A
600 mA	4.5	6 A	45 A
700 mA	5 A	7 A	50 A
800 mA	5.5 A	8 A	55 A
900 mA	6 A	9 A	60 A
Customized ¹		Customized	

¹ Only if the value of the customized trigger threshold does not exceed 6A

Delay time (s)
Instantaneous Channel delay time, the possible values are:

Instantaneous:	Selective	0.1 s
0.4 s	0.8 s	1 s
3 s	5 s	10 s
Customized		

Type of relay output
☐ Normally open
☒ Normally closed Channel output relay operating mode.

Number of reclosures
0 Number of attempts at reconnection. After this number the relay will be locked.

Time between reclosing (s)
1 Time interconnections.

Type of time between reclosing
☐ Normal
☒ Exponential Operating mode in the time interconnections.

1.6.2 Displaying values

The CBS-8 device will show the following value screen:



Where:



1. Channel status:

- Status ON.
- Pre-alarm status.
- Status OFF.

2. Relay status:

- ON. Non-locked channel
- OFF. Channel locked

3. Additional information on the status of the channel:

- *Pre-alarm*: Pre-alarm enabled
- *Reconnection*: Channel disconnected with timed reconnection process.
- *Remote*: Channel disconnected by external triggering, cannot be automatically reconnected.

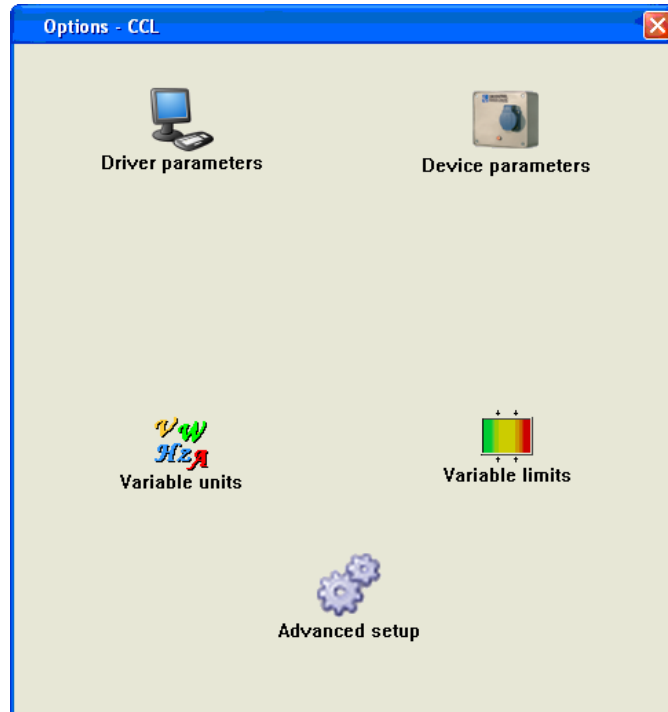
4. Reconnection enabled. Reports that channel reconnections have been enabled.

5. Reset button. If the channel is triggered, the button will remain disabled. Push the button to restart the channel.
6. OFF button. External disconnection of the channel. The button will remain disabled if the channel has not been triggered.
7. Adjustment button. Enables programming of sensitivity and channel delay. Channel information is also shown.
8. Channel trip threshold value configured.
9. Channel pre-alarm value configured
10. Channel instantaneous differential current value.
11. When the channel Instantaneous differential current value exceeds the limits of the value bar, either in excess or default, this will be indicated as shown in the figure (arrow below the value)
12. Differential current value detected when the channel triggers.

1.7 CCL

1.7.1 Driver options

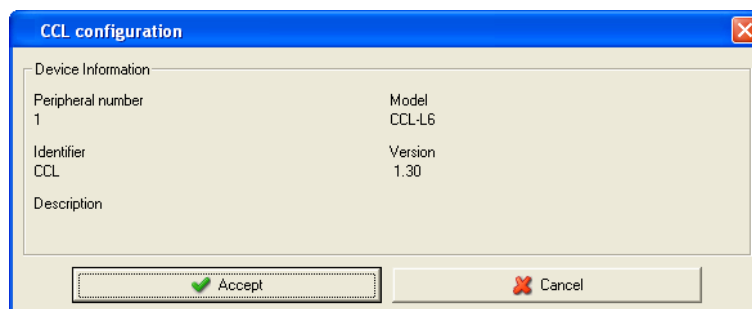
Options menu:



The '*Variable units*' and '*Variable limits*' options are explained in detail in sections **1.1.2 Variable Units** and **1.1.3 Variable limits**, respectively.

1.7.1.1 Device parameters

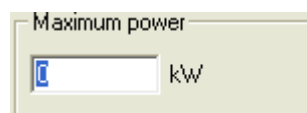
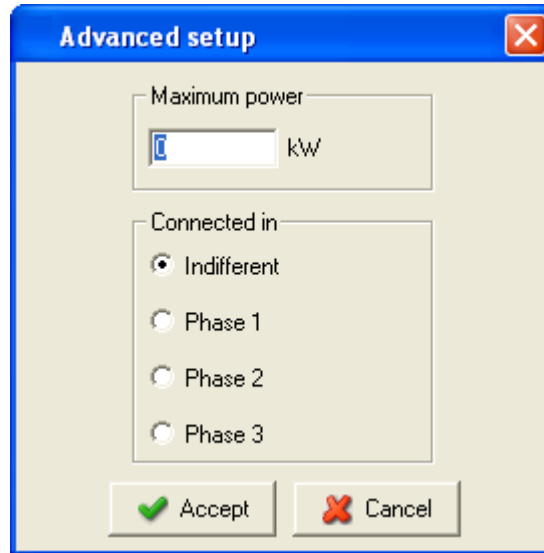
This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.



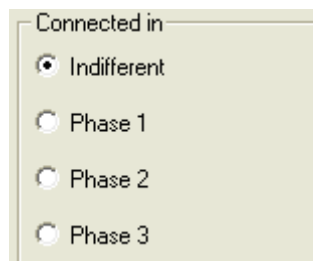
Device Information	
Peripheral number	Model
1	CCL-L6
Identifier	Version
CCL	1.30
Description	

Displays general information about the device.

1.7.1.2 Advanced configuration



Allows you to assign a maximum power value to be used by the device.



Allows you to select the device connection mode: single-phase or three-phase.

1.8 CIRWATT

1.8.1 Download with protocol IEC 870-5-102

The CIRWATT device allows load curve and bill closures files to be downloaded through the IEC 870-5-102 protocol. To enable downloading when new equipment is added the "Download files (IEC 870-5-102)" option must be selected and the gateway, the measuring point address, and password configured.

Modify CIRWATT Ethernet

Name: CIRWATT

Description:

Peripheral number: 1

☒ Descargar ficheros (IEC 870-5-102)

Link address: 1

Measure point address: 1

Access key: 1

Time zone: (GMT+01:00) Bruselas, Copenhagen, Madrid, Paris

IP address: 192.168.1.213

Port: 10001

Configuration port: 30718

Buttons: Setup, Advanced setup, Accept, Cancel

From this screen it is possible to configure the time zone where the CIRWATT is located, by default the time zone of the software will appear but this should be modified if a new device is found in a different time zone.

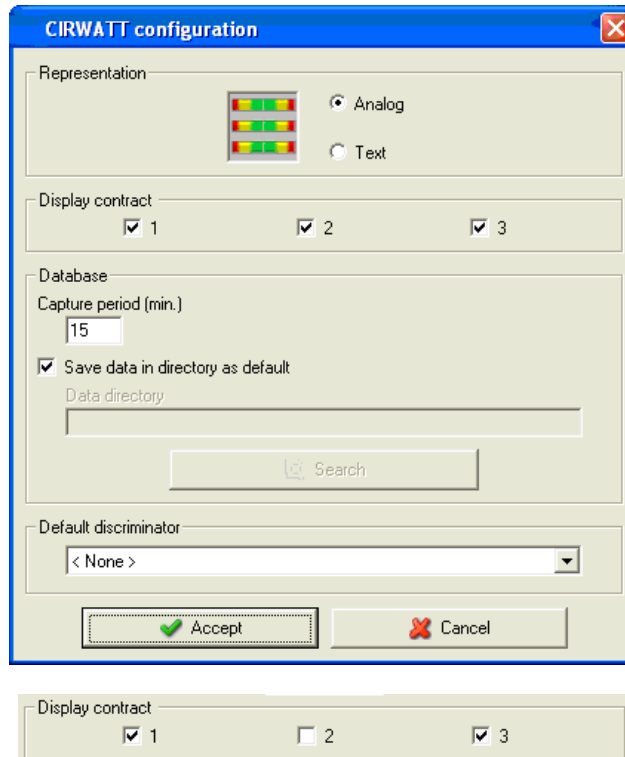
1.8.2 Driver options

Options menu:



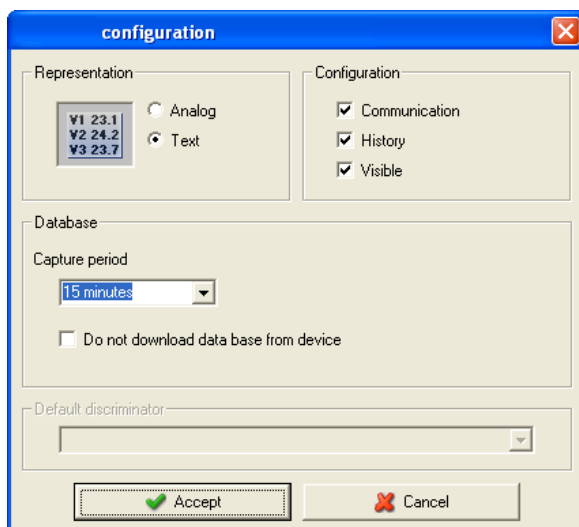
The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.8.2.1 Driver parameters



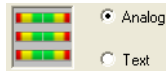
Allows the contracts to be displayed on screen to be selected. Using these selectors the contracts shown on screen can be selected. In this case the driver displays contracts 1 and 3, and will hide contract 2. These parameters will only affect the screen display of the CIRWATT device contracts but not the internal configuration of the CIRWATT device.

1.8.3 The remaining parameters are explained in section 1.1.1 Driver Parameters

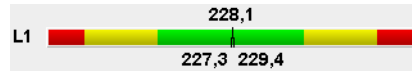


From this screen we can configure the variable display type on screen and configure where to save the data files.

There are two types of data representation.



Analogue representation, the variables are graphically represented by bars as

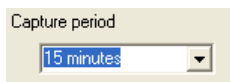


Where instantaneous value, maximum and minimum values are represented.

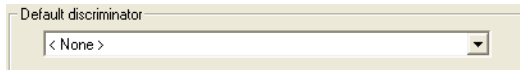


Text mode representation, the variables are represented as

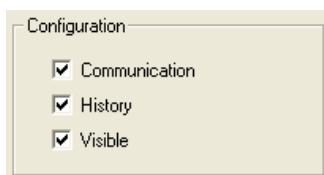
Phase-neutral (V)	228,2	229,6	229,7
-------------------	-------	-------	-------



The capture period is entered into this field. This indicates the time interval which elapses between the device history recordings. The periods permitted are 10, 15, 20 and 30 seconds, 1 minute and multiples up to a maximum of 60 minutes.



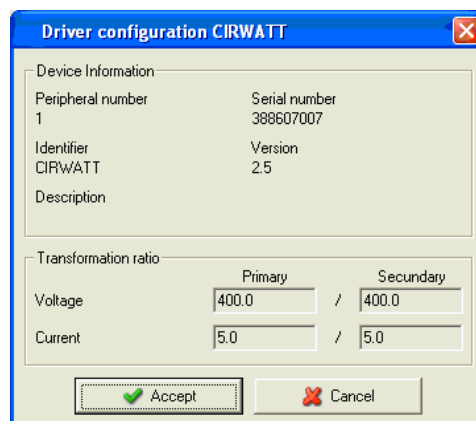
This selector will assign a default filter to the device. This option appears only in those devices possessing variables that can be filtered. If we select a filter, when making graphs or tables, the variables are displayed initially as filtered, although it is also possible to see the variables without the filter, or see them through a filter other than the default one.



Using we can activate or deactivate communication with a device, decide whether or not to save device histories and whether or not to allow a user to see a device from the client.

1.8.3.1 Device parameters

This screen will allow a series of internal information and device parameters to be displayed on screen.



PowerStudio


Device Information	
Peripheral number	Serial number
1	388607007
Identifier	Version
CIRWATT	2.5
Description	

Displays general information.


Transformation ratio		
	Primary	Secondary
Voltage	400.0	400.0
Current	5.0	5.0



- **Voltage transformation ratio:** shows the ratio between primary and secondary voltage programed into the device.
- **Power transformation ratio:** Shows the ratio between the primary and secondary currents programed into the device.

1.8.3.2 Contracted power

This screen allows the contracted loads for each contract and CIRWATT rate to be displayed. It is always be possible to enter contracted power manually, but if the device is IEC enabled it can also be read directly from the equipment by clicking the button .

Configuration of contracted powers CIRWATT			
Contracted power (W)			
	Contract 1	Contract 2	Contract 3
Tariff 1	0	0	0
Tariff 2	0	0	0
Tariff 3	0	0	0
Tariff 4	0	0	0
Tariff 5	0	0	0
Tariff 6	0	0	0
Tariff 7	0	0	0
Tariff 8	0	0	0
Tariff 9	0	0	0

 Read powers

1.8.4 Displaying Contracts

The CIRWATT device shows the following screen when viewing a contract:

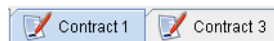
Instantaneous Contract 1 Contract 2 Contract 3							
	Active energy (kWh)	Active energy - (kWh)	Inductive energy 1Q (kvarLh)	Capacitive energy 2Q (kvarCh)	Inductive energy 3Q (kvarLh)	Capacitive energy 4Q (kvarCh)	
2							
1							
T1	778,000	11,000	6,000	2,000	0,000	150,000	
T2	74,000	0,000	3,000	0,000	0,000	14,000	
T3	35,000	0,000	1,000	0,000	0,000	5,000	
T4	0,000	0,000	0,000	0,000	0,000	0,000	
T5	0,000	0,000	0,000	0,000	0,000	0,000	
T6	0,000	0,000	0,000	0,000	0,000	0,000	
T7	0,000	0,000	0,000	0,000	0,000	0,000	
T8	0,000	0,000	0,000	0,000	0,000	0,000	
T9	0,000	0,000	0,000	0,000	0,000	0,000	
TOTAL	887,000	11,000	10,000	2,000	0,000	169,000	

Where:

1. Corresponds to the information of a new contract rate.
2. Marks the active rate of the contract.
3. Marks the active quadrant.



Select the various tabs to display the desired contract. As indicated in section 1.9.2.1 Driver parameters, it is possible to select which contracts we want to view, and the tab corresponding to the hidden contracts will not appear. For example if you only want to view contracts 1 and 3 the tabs will be as follows:



1.9 CIRWATT B

1.9.1 CirWatt B configuration

The image shows two side-by-side screenshots of configuration windows for CirWatt B.

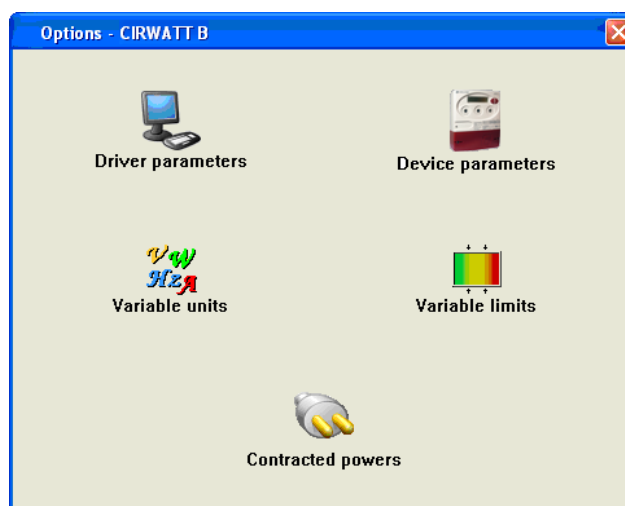
New CIRWATT B RS: This window has fields for Name (CirWatt B), Description, Peripheral number (1), Link address (1), Measure point address (1), Access key (2), and Time zone ((GMT+01:00) Bruselas, Copenhagen, Madrid, París). It also has a Port field (7) and buttons for Advanced setup, Accept, and Cancel.

New CIRWATT B Ethernet: This window has fields for Name (CirWatt B), Description, Peripheral number (1), Link address (1), Measure point address (1), Access key (1), Time zone ((GMT+01:00) Bruselas, Copenhagen, Madrid, París), IP address (192.168.6.150), Port (10001), and Configuration port (30718). It also has buttons for Setup, Advanced setup, Accept, and Cancel.

From this screen it is possible to configure the time zone where the CIRWATT is located, by default the time zone of the software will appear but this should be modified if a new device is found in a different time zone.

1.9.2 Driver options

Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.9.2.1 Device parameters

This screen will allow a series of internal information and device parameters to be displayed on screen.

Driver configuration CIRWATT B

Device Information

Peripheral number	Serial number
1	500900853
Identifier	Version
CirWatt B	0.6.2
Description	

Transformation ratio

	Primary		Secondary
Voltage	400.0	/	400.0
Current	10.0	/	10.0

Geographical coordinates

Desplazamiento Horario en minutos: 120

Longitud: 33 * 4 West Latitud: 55 * 6 North

Output 1 | Output 2 | Output 3 | Output 4

Function: 1 - In active energy

Pulse weight: 39

Accept Cancel

Device Information

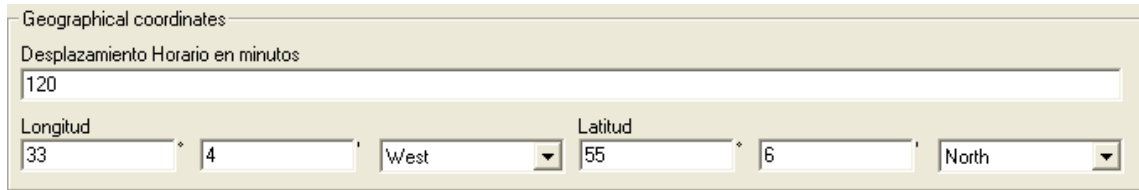
Peripheral number	Serial number
1	500900853
Identifier	Version
CirWatt B	0.6.2
Description	

Displays general information.

Transformation ratio

	Primary		Secondary
Voltage	400.0	/	400.0
Current	10.0	/	10.0

- **Voltage transformation ratio:** shows the ratio between primary and secondary voltage programmed into the device.
- **Power transformation ratio:** Shows the ratio between the primary and secondary currents programmed into the device.



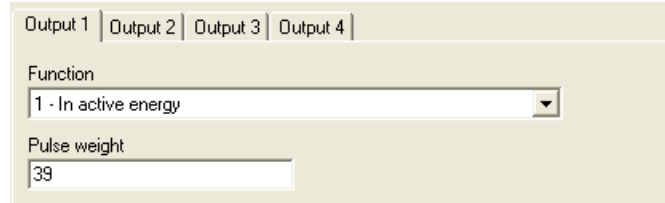
Geographical coordinates

Desplazamiento Horario en minutos
120

Longitud 33 ° 4 ' West Latitud 55 ° 6 ' North

Time zone where the device is located.

The configuration of the geographical coordinates will only appear when the device has the astronomical clock option.



Output 1 | Output 2 | Output 3 | Output 4 |

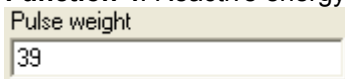
Function
1 - In active energy

Pulse weight
39

The digital output configuration will only appear when the device has digital outputs. The number of digital outputs will depend on the device model.

Depending on the function, it will be possible to configure additional parameters associated with the function selected.

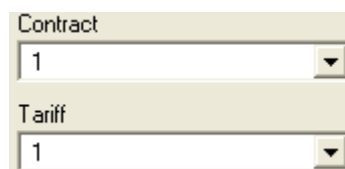
- **Function 1:** Incoming active energy.
- **Function 2:** Outgoing active energy.
- **Function 3:** Reactive energy Q1/Q2.
- **Function 4:** Reactive energy Q3/Q4.



Pulse weight
39

Value between 0.1 and 65535 with one decimal.

- **Function 5:** Maximeter.
Function without additional parameters.
- **Function 6:** RM in tariff period.



Contract
1

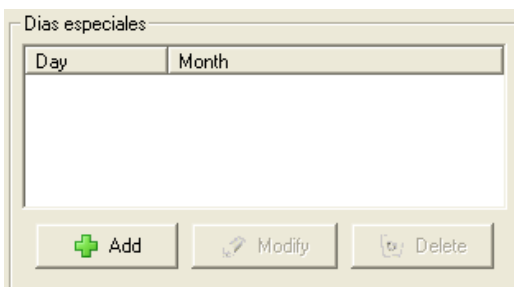
Tariff
1

Contract: Value between 1 and 3.

Tariff: Value between 1 and 9.

- **Function 106:** Astronomical.

This function can only be configured in equipment with an astronomical clock.



Dias especiales

Day	Month


+ Add ✎ Modify 🗑 Delete

You will be able to configure a maximum of seven special days.

You will be able to define a maximum of eight operations.

- **Function 255:** Deactivated.

1.9.2.2 Contracted power

This screen displays the contracted powers. You will always be able to enter the contracted powers manually and read them directly from the equipment by pressing the  Read powers button.

	Contract 1	Contract 2	Contract 3
Tariff 1	0	0	0
Tariff 2	0	0	0
Tariff 3	0	0	0
Tariff 4	0	0	0
Tariff 5	0	0	0
Tariff 6	0	0	0
Tariff 7	0	0	0
Tariff 8	0	0	0
Tariff 9	0	0	0

1.9.3 Entradas digitales

Algunos Cirwatt B's poseen una tarjeta de entradas digitales. Para saber si entradas externas están abiertas o cerradas y contar las veces que se abren y cierran.

Puede comprobar si su equipo tiene o no entradas digitales mirando el manual del equipo. Destacar que la versión del firmware del equipo debe ser la 01.00.05 o posterior, de lo contrario los equipos con entradas digitales y firmwares anteriores a la citada no comunicarán. Comentar también que las variables que cuentan los cierres de las entradas digitales no se pueden volver a poner a valor 0.

1.10 CDR-8

1.10.1 Driver options

Options menu:



1.10.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

CDR-8 configuration

Device Information

Peripheral number 10	Model CDR-8
Identifier CDR-8	Version 1.60
Description	

Configure prealarm

Type of prealarm relay

☒ Normally open

☐ Normally closed

Prealarm threshold (%)

50

Defined values

Current (A)

0

Delay time (s)

0

Device

☐ Enable reclosing

☒ Synchronise clock

Hysteresis for this channel in relay mode (%)

5

Channel 1 | Channel 2 | Channel 3 | Channel 4 | Channel 5 | Channel 6 | Channel 7 | Channel 8

Channel 1

Description Channel 1	Trip threshold (A) 0,4	Detection mode <input checked="" type="radio"/> HIGH <input type="radio"/> LOW
Type of toroid 30 mA ... 6A (WG/WGS)	Delay time (s) Instantaneous	Number of reclosures 0
Operating mode <input type="radio"/> Earth leakage mode <input checked="" type="radio"/> Relay mode	Delay time OFF (s) 0,4	Time between reclosing (s) 1
Type of relay output <input checked="" type="radio"/> Normally open <input type="radio"/> Normally closed	Latch selection <input checked="" type="radio"/> With latch option <input type="radio"/> Without latch option	Type of time between reclosing <input type="radio"/> Normal <input checked="" type="radio"/> Exponential

PowerStudio

Device Information	
Peripheral number 10	Model CDR-8
Identifier CDR-8	Version 1.60
Description	

Shows general information.

Configure prealarm
Type of prealarm relay <input checked="" type="radio"/> Normally open <input type="radio"/> Normally closed
Prealarm threshold (%) <input type="text" value="50"/>

The following can be configured:

- *Type of pre-alarm relay.* Operation method of the pre-alarm relay common to all channels of the device.
- *Pre-alarm threshold.* Pre-alarm threshold the equipment possesses. This can vary between 50 and 100% of the minimum trigger threshold of the device channels.

Defined values
Current (A) <input type="text" value="0"/>
Delay time (s) <input type="text" value="0"/>

A trigger threshold and a user-personalized delay time can be configured by the user. These parameters are common to all channels of the device. Depending on the type of channel selected, the customized threshold may be selected or not.

Device
<input type="checkbox"/> Enable reclosing
<input checked="" type="button" value="Synchronise clock"/>

This selector allows the equipment to have the channel reconnections enabled or not. Depending on whether the reconnections are enabled or not, some of the channel configuration fields will be enabled or disabled. Clicking on the 'Synchronize clock' button the present PC time will be sent to the device.

Hysteresis for this channel in relay mode (%)
<input type="text" value="5"/>

% Of hysteresis for the connection and disconnection of the channel configured in the relay mode.

Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7	Channel 8
Description Channel 1		Trip threshold (A) 0.4		Detection mode <input checked="" type="radio"/> HIGH <input type="radio"/> LOW			
Type of toroid 30 mA .. 6A (wG/wGS)		Delay time (s) Instantaneous		Number of reclosures 0			
Operating mode <input type="radio"/> Earth leakage mode <input checked="" type="radio"/> Relay mode		Delay time OFF (s) 0.4		Time between reclosing (s) 1			
Type of relay output <input checked="" type="radio"/> Normally open <input type="radio"/> Normally closed		Latch selection <input checked="" type="radio"/> With latch option <input type="radio"/> Without latch option		Type of time between reclosing <input type="radio"/> Normal <input checked="" type="radio"/> Exponential			

Shows the channel configuration.

Channel 1 | Channel 2 | Channel 3 | Channel 4 | Channel 5 | Channel 6 | Channel 7 | Channel 8

As it is only possible to display the configuration of one channel at a time, click on one of the channels to display the corresponding configuration.

Description
Channel 1

Alphanumeric type information where a brief description of the channel can be entered for easy identification.

Type of toroid
30 mA .. 6A (W/G/WGS)

Toroid type connected to the channel. There are three possible selection options:

- Channel disabled
- Fullscale channel of 6A (30mA .. 6A)
- Fullscale channel of 60A (300mA .. 60A)

Operating mode
☐ Earth leakage mode
☒ Relay mode

Channel operating mode. Depending on the selected mode, some of the configuration options of the channel may be disabled.

Type of relay output
☒ Normally open
☐ Normally closed

Channel output relay operating mode.

Trip threshold (A)
0.4

Channel triggering threshold, depending on the type of toroid connected the available values will be:

Toroid 30 mA...6A		Toroid 300 mA 60A ...	
30 mA	1 A	300 mA	10 A
50 mA	1.5 A	500 mA	15 A
100 mA	2 A	1 A	20 A
200 mA	2.5 A	2 A	25 A
300 mA	3 A	3 A	30 A
400 mA	3.5 A	4 A	35 A
500 mA	4 A	5 A	40 A
600 mA	4.5 A	6 A	45 A
700 mA	5 A	7 A	50 A
800 mA	5.5 A	8 A	55 A
900 mA	6 A	9 A	60 A
Customized ¹		Customized	

¹ Only if the value of the customized trigger threshold does not exceed 6A

Delay time (s)
Instantaneous

Channel delay time, depending on the selected operating mode, the possible values are:

Instantaneous:	Selective	0.1 s
0.4 s	0.8 s	1 s
3 s	5 s	10 s
60 s ¹	Customized	

¹ Only if the channel works on the relay mode

Delay time in the channel reset when working on the relay mode, the possible values are:

0.1 s	0.4 s	0.8 s
-------	-------	-------

1 s	3 s	5 s
10 s	60 s	Customized

Latch selection

☒ With latch option

☐ Without latch option

Channel lock selection when working on the relay mode.

Detection mode

☒ HIGH

☐ LOW

Triggering selection; low current (LOW) or overcurrent (HIGH) of the channel when working in relay mode.

Number of reclosures

0

Number of attempts at reconnection. After this number the relay will be locked.

Time between reclosing (s)

1

Time interconnections.

Type of time between reclosing

☐ Normal

☒ Exponential

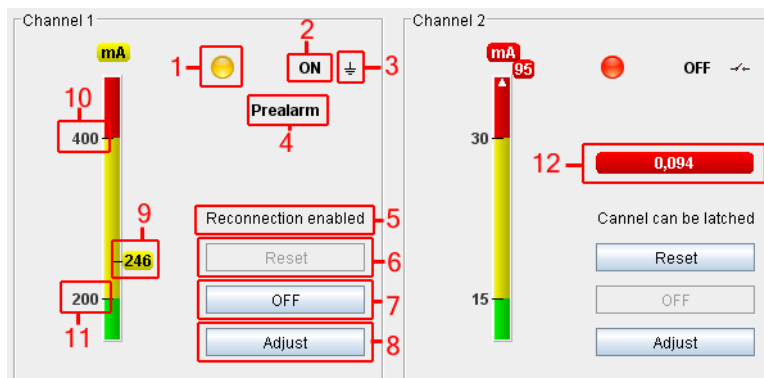
Operating mode in the time interconnections.

1.10.2 Displaying values

The CDR-8 device will display the following screen values:



Where:



1. Channel status:


- ● Status ON.
- ● Pre-alarm status.
- ● Status OFF.

2. Relay status:

- ON. Unlocked channel
- OFF. Locked channel

3. Channel operating mode:

- \oplus Differential mode

-  Relay mode
4. Additional information on the status of the channel:
 - *Pre-alarm*: Pre-alarm enabled
 - *Reconnection*: Channel disconnected with timed reconnection process.
 - *Remote*: Channel disconnected by external triggering, cannot be automatically reconnected.
 5. Additional channel information:
 - *Reconnection enabled*: Reports that channel reconnections have been enabled. Only if the channel is in differential mode
 - *Channel can be locked*: Reports that the channel will remain locked when triggered, with manual or remote reset being necessary. Only if the channel is in relay mode.
 6. Reset button. If the channel is triggered, the button will remain disabled. Push the button to restart the channel.
 7. OFF button. External disconnection of the channel. The button will remain disabled if the channel has not been triggered.
 8. Adjustment button. Enables programming of sensitivity and channel delay. Channel information is also shown.
 9. Channel instantaneous differential current value. When the channel Instantaneous differential current value exceeds the limits of the value bar, either in excess or default, this will be indicated as shown in the figure (arrow below the value)
 10. Channel trip threshold value configured.
 11. Channel pre-alarm value configured
 12. Differential current value detected when the channel triggers.

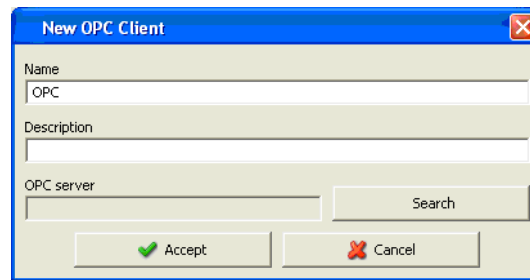
1.11 OPC Client²

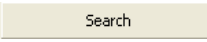
This PowerStudio driver allows a OPC-DA client to be configured to access the variables accessible on a OPC-DA server.

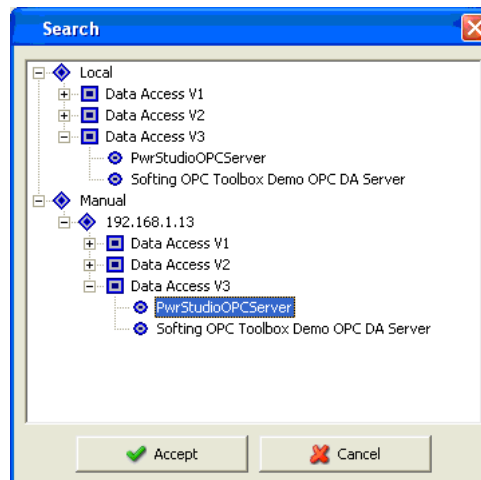
Once the variables to be read have been configured, the OPC client will behave in a manner similar to other devices with which the program communicates.

1.11.1 OPC connection configuration

To add a new OPC client the OPC server to which it has access must be indicated.



Pressing button  brings up a dialogue to conveniently select the OPC server. We may select a local server that has previously been configured on our machine, or enter the IP address of a machine on the local network to seek all the OPC servers that it may have configured. The OPC specifications supported by the client are "Data Access V1", "Data Access V2" and "Data Access V3".



² Only in Deluxe version

1.11.2 Driver options

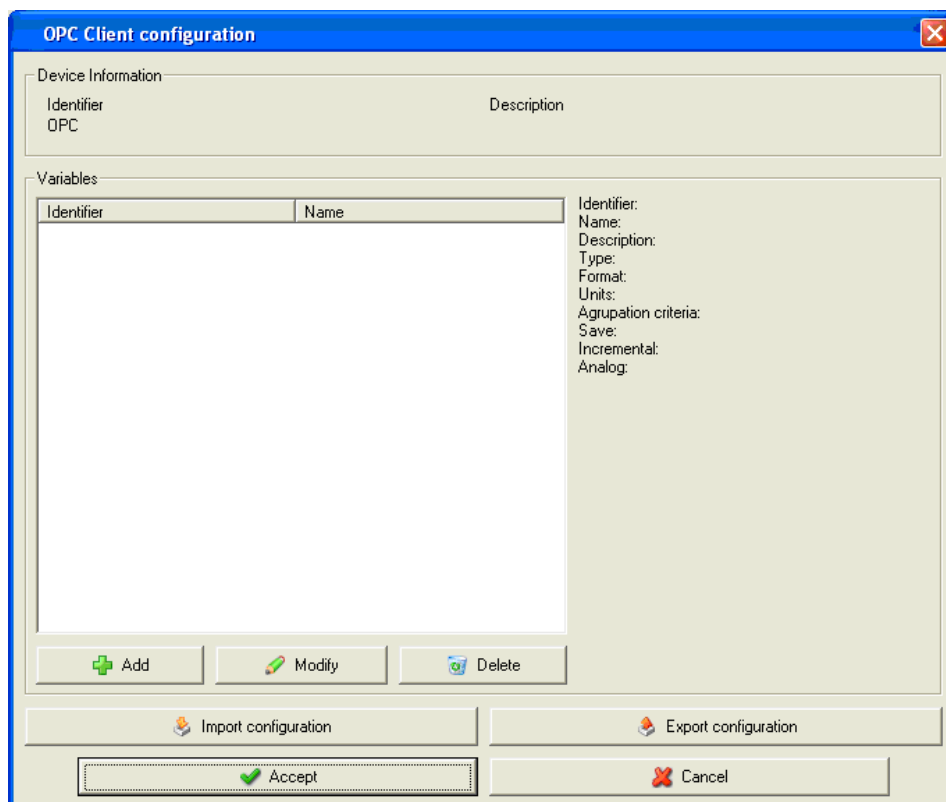
Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.11.2.1 Device parameters

This screen is used to configure the variables that should be requested from the OPC server.



Device Information	
Identifier	Description
OPC	

General OPC client

information.

Variables	
Identifier	Name

Identifier: _____
 Name: _____
 Description: _____
 Type: _____
 Format: _____
 Units: _____
 Agrupation criteria: _____
 Save: _____
 Incremental: _____
 Analog: _____

Add Modify Delete

OPC client variable

Configuration. See 1.12.2.1.1 Numeric variables.

Import configuration

Allows loading of a variable configuration that was previously saved to disk. This option is useful when the same variables have to be configured on several OPC clients.

Export configuration

Allows the variable configuration to be saved to disk, so that it can subsequently be loaded on another OPC client.

1.11.2.1.1 Variables

Pushing the "Add" or "Modify" button brings up a dialogue to configure the variable.

New variable ✕

Identifier:

Name:

Description:

Group:

Item:

Select variables

Type

☒ Reading

☐ Writing

☐ Reading/Writing

Format

☐ Original

☒ Forced

☐ With sign

Decimals:

Other

☒ Save

☐ Incremental

☒ Analog variable

Agrupation criteria

☐ Maximum value

☐ Minimum value

☒ Average value

☐ Last value

☐ Values summation

Units

Type: Accuracy (bits):

Zero: Fullscale:

Use

Discriminator

Events

Screen

Reports

Graphic/Table

Force

Accept

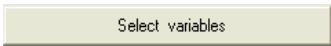
Cancel

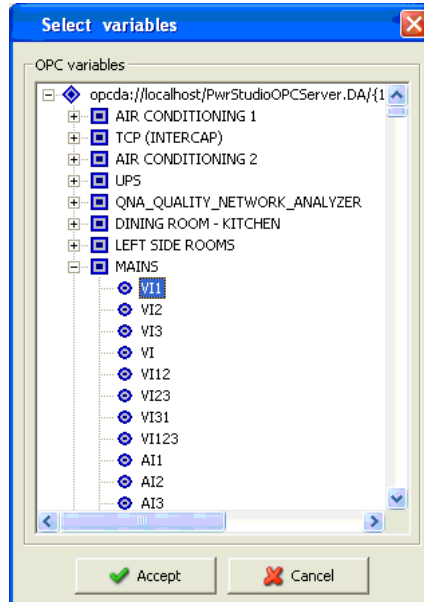
Where

- **Identifier:** Allows each of the binary variables to be used in expressions and conditions to be identified, see 'Editor Manual'.

- **Name:** Variable name, used to better identify it.
 - **Description:** Short description of the variable.
 - **Group:** Identifier of the group the variable belongs to in the OPC server.
 - **Item:** Identifier of the item the variable belongs to in the OPC server.
 - **Others:** Different variable configuration parameters
 - **Save:** Indicates whether or not the server value read should be saved in the value log.
 - **Incremental:** Indicates whether the value of the variable displayed is incremental. Typical energy variable option to see increments.
 - **Analogue variable:** Indicates whether or not the variable to be read is analogue type.
 - **Zero:** Value of the parameter to which the zero of the scale is assigned.
 - **Fullscale:** Value of the parameter to which the maximum value of the scale is assigned.
 - **Type:** Type of output, allows between 0-20 mA, 4-20 mA or 0 -? V, depending on the device.
 - **Accuracy:** Number of bits in the sample.
 - **Format:** Variable data format indicated.
 - Original: Based on how the variable is configured on the OPC server one conversion or another will be made.
 - VT_R4 handled as floating type value.
 - VT_UI4 handled as integer value with no symbol.
 - VT_R8 handled as double type value.
 - Any other type will display the value converted into a string.
 - Forced: Indicate whether or not the variable has a symbol and the number of decimals.
 - **Type:** Selects the type of variable; i.e., read, write or both. If the variable is write or read/write the value can be forced on the device.
 - **Grouping criteria:** Enables the variable values grouping criteria to be selected in graphs, tables, reports and the value to be saved in the values register. For example, if in the period between saving information we have 3 values (10, 12 and 7) these will be saved in the log register.
 - Maximum value: The maximum value of 3 (12) will be saved
 - Minimum value: The minimum value of 3 (7) will be saved.
 - Average value: The average value of 3 $((10 + 12 + 7) / 3 = 9.66)$ will be saved.
 - Last value: The last value will be saved (7).
 - Sum of the values: The last value will be saved (7).
- In the case of clusters of values in graphs, tables and reports the same criteria will be followed, except when it is the summation of values, where the sum of 3 values is shown ($10 + 12 + 7 = 29$).
- **Units:** Units in which the value is expressed. You can select one of the predefined units or define a new user unit.

- **Use:** Shows where the variable may be used in the rest of the program.

- **Select variables:** Pressing the  button brings up the variables selection dialogue of the previously configured OPC server, and all the groups and items that can be accessed from it are displayed.



1.12 PowerStudio client³

The PowerStudio client driver allows PowerStudio devices and variables to be accessed when running on a remote machine.

Once the variables to be read have been configured, the PowerStudio client will behave in a manner similar to other devices with which the program communicates.

1.12.1 PowerStudio client device configuration

Use the devices menu to add a new PowerStudio client as a first level device.

A screenshot of a Windows-style dialog box titled "New PowerStudio" with a red close button in the top right corner. The dialog has a light beige background. It contains several input fields: "Name" (a single-line text box), "Description" (a single-line text box), "Server" (a single-line text box), "Port" (a single-line text box), "User name" (a single-line text box), and "Password" (a single-line text box). There are two checkboxes: "Download variables of all devices" and "Anonymous user", both of which are currently unchecked. At the bottom, there are two buttons: "Accept" with a green checkmark icon and "Cancel" with a red X icon.

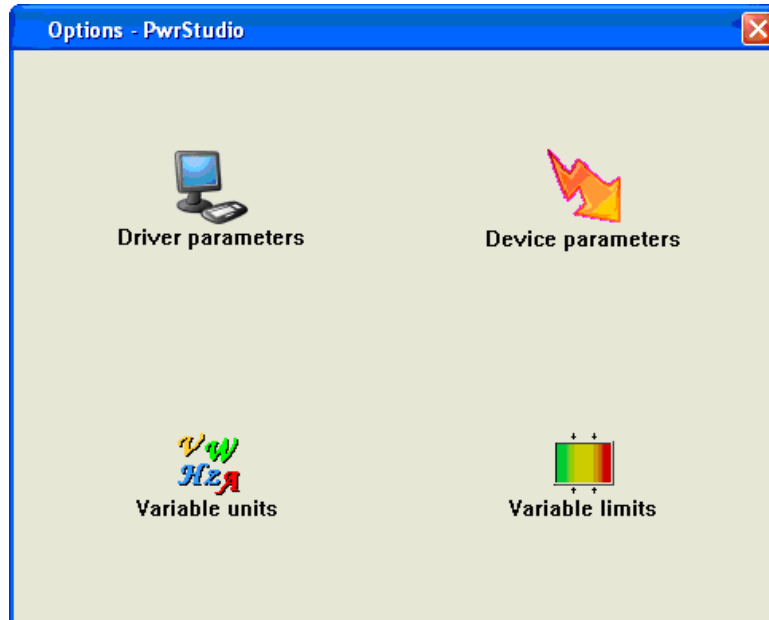
As shown in the previous dialogue, the address and port of the remote PowerStudio server to which we want to connect must be indicated, and also the user and password if authentication is enabled.

The 'Download variables from all the machines' option may be chosen, in which case all machines and variables accessible in remote PowerStudio will automatically be downloaded. If this option is not set, each variable must be added manually.

³ Only in Deluxe version

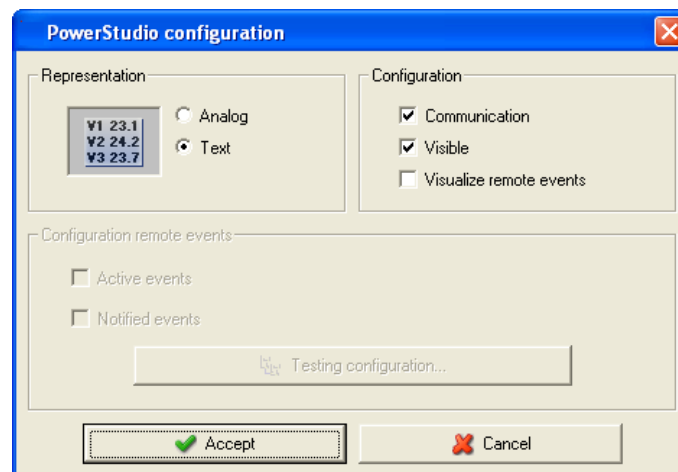
1.12.2 Driver options

Options menu:



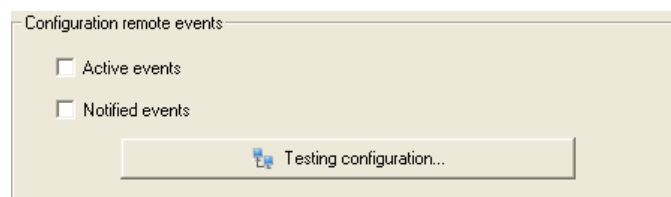
The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.12.2.1 Driver Parameters



☐ Visualize remote events

Allows the display of remote events in the client to be activated.

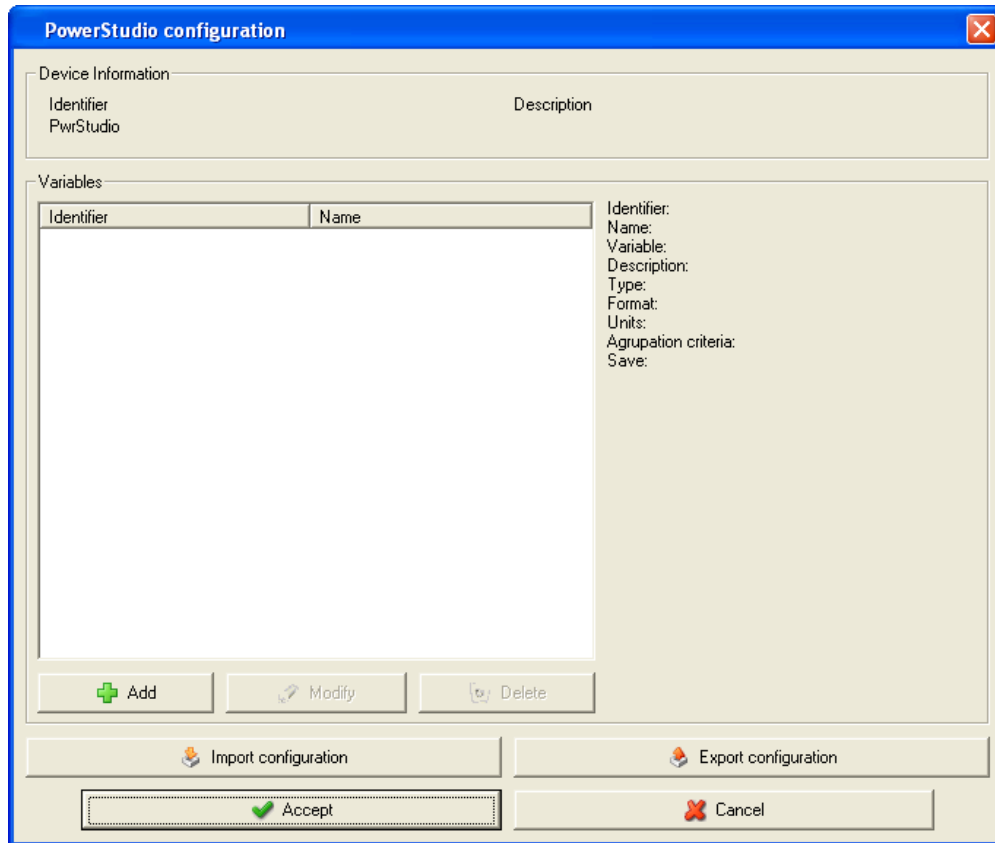


On activating the display of remote events the configuration of remote events will be enabled; here you can activate the types of events you want to receive and you can test communication with the remote equipment. These events can be displayed in the client in the same way as local events.

The remaining screen parameters are detailed in section 1.1.1 Driver parameters.

1.12.2.2 Device parameters

This screen is used to configure the variables that should be requested from the remote PowerStudio.

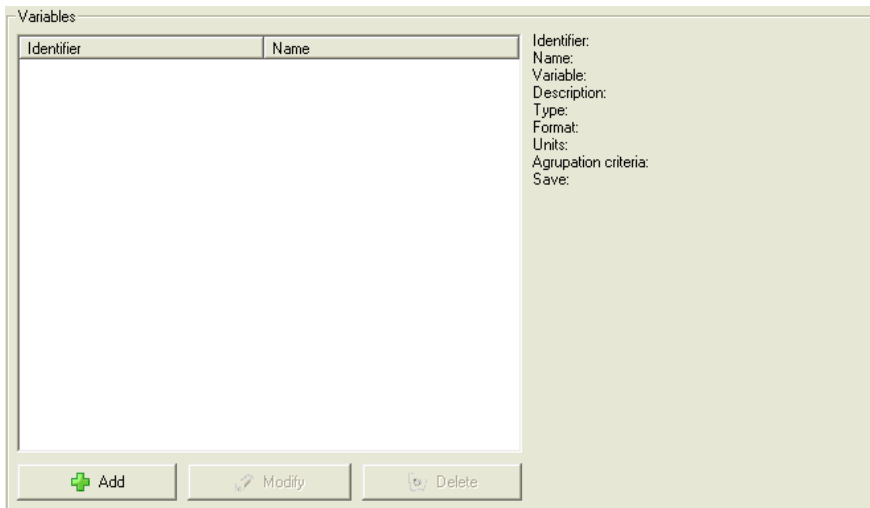


The image shows a 'PowerStudio configuration' dialog box. It has a blue title bar with the text 'PowerStudio configuration' and a close button. The dialog is divided into two main sections: 'Device Information' and 'Variables'. The 'Device Information' section contains a table with two columns: 'Identifier' and 'Description'. The 'Identifier' column contains the text 'PwrStudio'. The 'Variables' section contains a table with two columns: 'Identifier' and 'Name'. Below this table are three buttons: 'Add' (with a green plus icon), 'Modify' (with a pencil icon), and 'Delete' (with a trash can icon). To the right of the 'Variables' table is a list of labels: 'Identifier:', 'Name:', 'Variable:', 'Description:', 'Type:', 'Format:', 'Units:', 'Agrupation criteria:', and 'Save:'. At the bottom of the dialog are four buttons: 'Import configuration' (with a folder icon), 'Export configuration' (with a folder icon), 'Accept' (with a green checkmark icon), and 'Cancel' (with a red X icon).

Device Information	
Identifier	Description
PwrStudio	

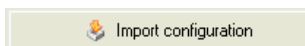
General PowerStudio client

information.

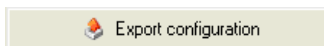


PowerStudio client

variables configuration.



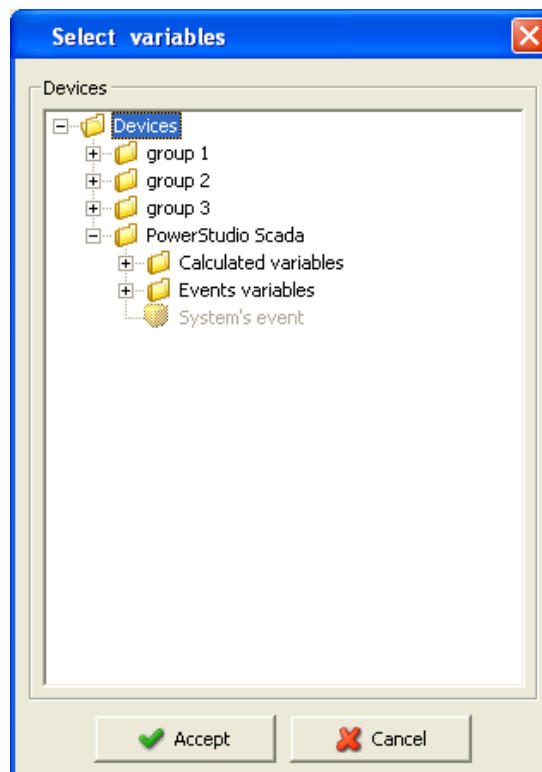
Allows loading of a variables configuration that was previously saved to disk. This option is useful when the same variables have to be configured on several PowerStudio clients.



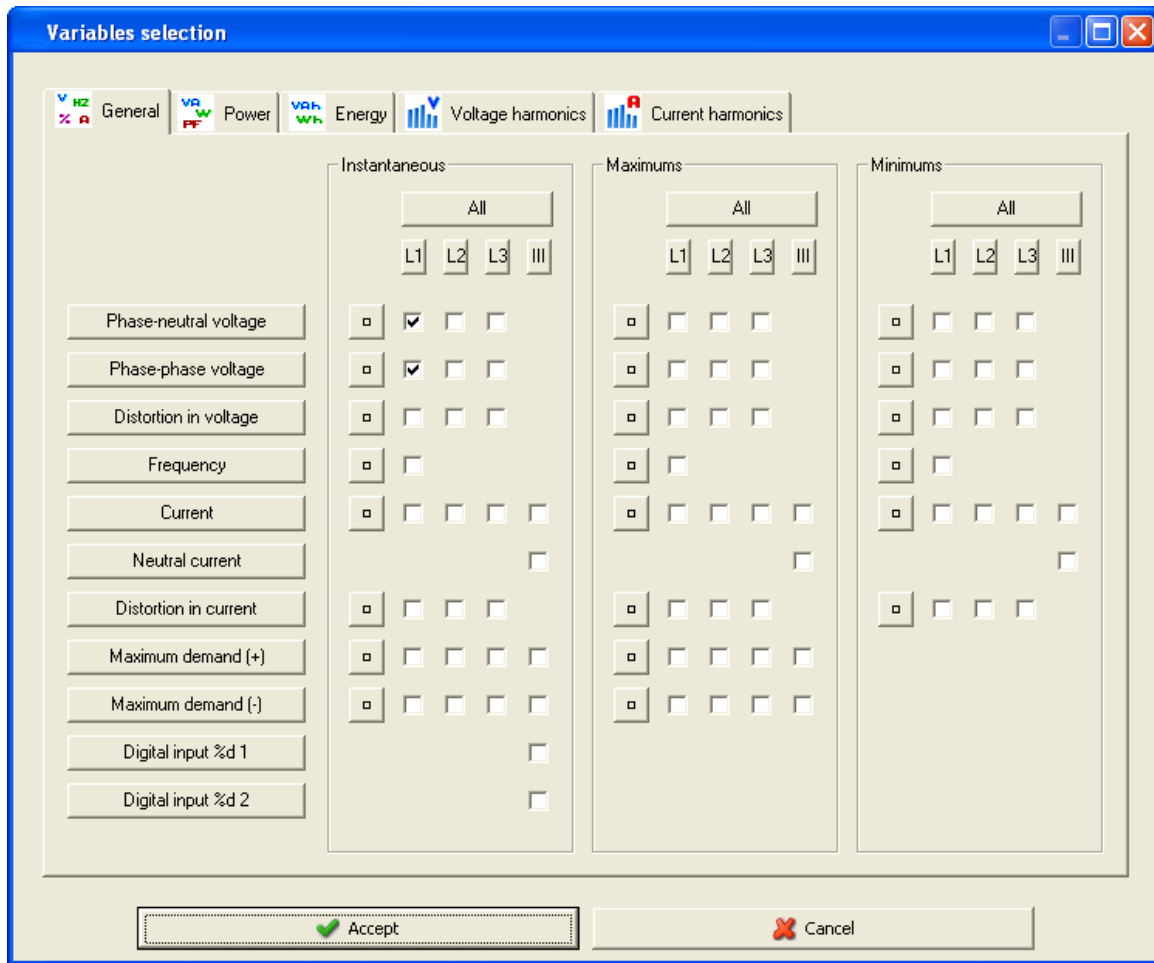
Allows the variable configuration to be saved to disk, so that it can subsequently be loaded on another PowerStudio client.

1.12.2.2.1 Variables

When the 'Add' button is pressed a tree of the remote PowerStudio devices will appear. When a device is selected, its variables selection screen will appear, and the desired variables may be added.



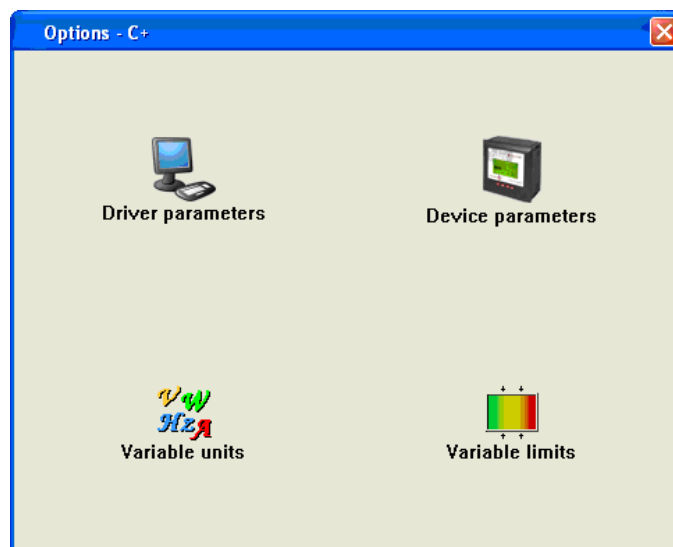
As an example of variables selection screen we have that of an 'CVM' where we can see that the 'Neutral Phase Voltage' and 'Phase-Phase Voltage' variables have been selected.



1.13 COMPUTER PLUS

1.13.1 Driver options

Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.13.1.1 Device parameters

This screen allows the device alarms to be configured. Upon opening the dialogue box, the software will read the device configuration. When complete, click on 'Accept' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

Computer Plus configuration

Device Information

Peripheral number	1	Model	Computer Plus T14-CDI
Identifier	C+	Version	1.01
Description	Current's connection V1 I1 S1 - S2 V2 I2 S1 - S2 V3 I3 S1 - S2 Direct sequence		

General | Alarms | Condenser's battery

Transformation ratio

	Primary		Secondary
Voltage	1	/	1
Current	5	/	5
Condenser current	5	/	5

Device

Reset

Synchronise clock

Connection time (seconds)

Off	Register
2	10

Cosine phi

Value	Type
99	Inductive

Accept Cancel

Depending on the device connected, some fields will be disabled.

Device Information

Peripheral number	1	Model	Computer Plus T14-CDI
Identifier	C+	Version	1.01
Description	Current's connection V1 I1 S1 - S2 V2 I2 S1 - S2 V3 I3 S1 - S2 Direct sequence		

Displays general information. Among other parameters the current connection configuration may be seen.

Transformation ratio

	Primary		Secondary
Voltage	1	/	1
Current	5	/	5
Condenser current	5	/	5

- **Voltage transformation ratio:** Primary and secondary voltage programming. The product of the primary value and the primary current must be the same as or less than 20,000,000.
- **Current transformation ratio:** This is the device primary current value. Value may be between 1 and 30,000 A. The secondary current is 1A or 5A.
- **Capacitor power measure transformation ratio :** The primary capacitor current measure value may be between 1A and 999A. The secondary capacitor current measure value may be between 1A and 5A.

Connection time (seconds)	
Off	Register
2	10

Machine connection and registration times. For the TF, TF-C and TF-CDI models the units are cycles, for the rest of models the units are seconds.

Cosine phi	
Value	Type
99	Inductive

Configuration of the inductive phi or capacitive cosine.

✓ Reset

Clicking the button resets the device energy counters to zero.

🕒 Synchronise clock

Clicking the button sends the PC's time of day to the machine.

Temperature Output: Normally open Maximum: 20 Minimum: -10 Relay: OFF	Voltage Output: Normally open Maximum: 10 Minimum: 0 Relay: ON
Earth leakage current Output: Normally open Maximum: 20 Minimum: 10 Relay: OFF	Lost IC Output: Normally closed Maximum: 20 Minimum: 5 Relay: ON
Kvar not compensated Output: Normally open Maximum: 10 Minimum: 5 Relay: ON	Cosine phi Output: Normally open Maximum: 0,20 Minimum: -0,20 Relay: ON
Low current Output: Normally open Maximum: 20 Minimum: 5 Relay: ON	THD V Output: Normally closed Maximum: 20,0 Minimum: 10,0 Relay: ON
THDIxl Output: Normally open Maximum: 15 Minimum: 5 Relay: ON	THDI Step Output: Normally closed Maximum: 1,5 Minimum: 0,5 Relay: ON
THDIC Output: Normally open Maximum: 10,5 Minimum: 9,5 Relay: ON	

From the alarms tab we can see how the alarms are configured for temperature, voltage, differential current, ic loss, non-compensated Kvar, phi cosine, low current, thdv, thdixi, thdi step and thdic.

- **Output:** This field shows whether the output is configured as normally open, normally closed or disabled.
- **Max:** In this box the maximum alarm value is indicated.
- **Min:** In this box the minimum alarm value is indicated.
- **Relay:** Allows one to indicate whether or not the alarm is associated with the global alarms relay.

The screenshot shows the 'Powers' and 'General' tabs of the PowerStudio interface. The 'Powers' tab displays 16 input fields for capacitor values, arranged in two columns. The 'General' tab displays several configuration options:

- P.Units:** MVar
- Voltage:** 0.1
- V.Units:** kV
- Connection:** DELTA
- Compensation:** PH-PH

From the capacitors tab the numeric capacity value of the 16 capacitors and their kVar or MVar units, voltage value and their V or kV units, the DELTA or WYE connection type and the type of PH-PH or TRIPH compensation may be seen.

1.14 COMPUTER SMART

1.14.1 Driver options

Options menu:



The '*Variable units*' and '*Variable limits*' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.14.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

Computer Smart configuration

Device Information

Peripheral number 1	Model Computer Smart 400V, 12
Identifier Computer SMART	Version 0.15
Description	

General | Alarms | Condenser's battery.

Cosine phi

Value 1.00	Type Capacitive
---------------	--------------------

C/K

Value 1.00

Program

Value 1111

Delay

Value 10

Steps

Value 13

Phase

Value 1

Primary

Value 5

Display

Value OFF

Backlight (%)

Value 60

Accept Cancel

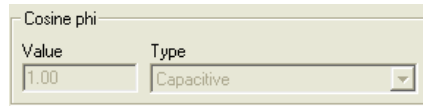
None of the fields in this dialogue box are editable.

Device Information

Peripheral number 1	Model Computer Smart 400V, 12
Identifier Computer SMART	Version 0.15
Description	

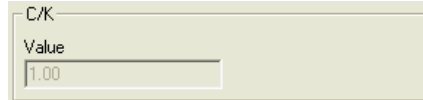
Displays general information about the device.

PowerStudio




A control panel titled "Cosine phi". It contains two fields: "Value" with a text input showing "1.00", and "Type" with a dropdown menu showing "Capacitive".

Displays the value and type of cosine phi. The type may be inductive or capacitive and the value will be between 0 and 1.



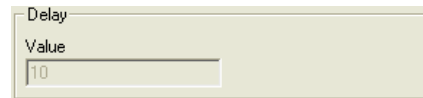
A control panel titled "C/K". It contains one field: "Value" with a text input showing "1.00".

Displays the value of the C/K variable; this value should be between 0 and 1.



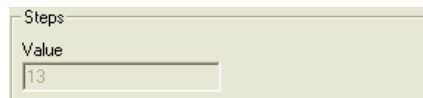
A control panel titled "Program". It contains one field: "Value" with a text input showing "1111".

Displays the program value, which can be "1111" or "1222" or "1244" or "1248" or "1122".



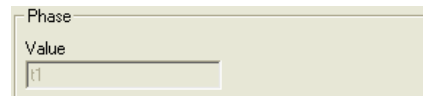
A control panel titled "Delay". It contains one field: "Value" with a text input showing "10".

Displays the action delay time in seconds; this value can be between 0 and 1000.



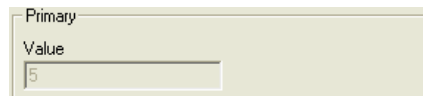
A control panel titled "Steps". It contains one field: "Value" with a text input showing "13".

Displays the number of steps + 1.



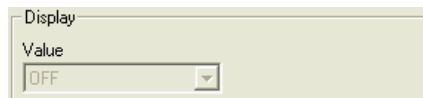
A control panel titled "Phase". It contains one field: "Value" with a text input showing "t1".

Displays the phase; its values are t1 to t6.



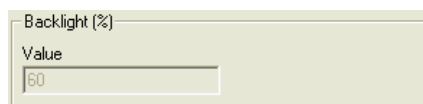
A control panel titled "Primary". It contains one field: "Value" with a text input showing "5".

Displays the value of the primary current; these values can range from 0 to 9999.



A control panel titled "Display". It contains one field: "Value" with a dropdown menu showing "OFF".

Displays the display status (ON or OFF).



A control panel titled "Backlight (%)". It contains one field: "Value" with a text input showing "60".

Displays the backlight % value; values between 0 and 100.

Computer Smart configuration

Device Information

Peripheral number 1	Model Computer Smart 400V, 12
Identifier Computer SMART	Version 0.15
Description	

General Alarms Condenser's battery

Ileak

OnOff OFF	Limit (mA) 300	Reset No
--------------	-------------------	-------------

Cosinus

Cosinus limit 0.95	I limit 20	Cosinus type Inductive
-----------------------	---------------	---------------------------

THD V (%)

Limit 5

THD I (%)

Limit 50

Temperature (°C)

Limit 60

Alarm 1	Enabled	Relay	Alarm 9	Enabled	Relay
	OFF	No		OFF	No
Alarm 2	Enabled	Relay	Alarm 10	Enabled	Relay
	OFF	No		OFF	No
Alarm 3	Enabled	Relay	Alarm 11	Enabled	Relay
	OFF	No		OFF	No
Alarm 4	Enabled	Relay	Alarm 12	Enabled	Relay
	OFF	No		OFF	No
Alarm 5	Enabled	Relay	Alarm 13	Enabled	Relay
	OFF	No		OFF	No
Alarm 6	Enabled	Relay	Alarm 14	Enabled	Relay
	OFF	No		OFF	No
Alarm 7	Enabled	Relay	Alarm 15	Enabled	Relay
	OFF	No		OFF	No
Alarm 8	Enabled	Relay	Alarm 16	Enabled	Relay
	OFF	No		OFF	No

Accept Cancel

Ileak

OnOff OFF	Limit (mA) 300	Reset No
--------------	-------------------	-------------

Displays the status, limit and reset of the Ileak alarm. The possible limit values are between 0 and 1500.

Cosinus

Cosinus limit 0.95	I limit 20	Cosinus type Inductive
-----------------------	---------------	---------------------------

Displays the cosine limit, I limit and the cosine type and cosine alarm. The possible values for the cosine limit are from 0 to 1, those of the I limit are between 0 and 9999, and cosine type can be inductive or capacitive.

THD V (%)	THD I (%)	Temperature (°C)
Limit 5	Limit 50	Limit 60

Displays the value of the limits for the THD V and THD I alarms in % and that for temperature in °C; temperature values can be between 0 and 256.

Alarm 1	Enabled	Relay
	OFF	No

For each of the 16 alarms, it displays whether it is enabled and the associated relay.

Computer Smart configuration

Device Information

Peripheral number	Model
1	Computer Smart 400V, 12
Identifier	Version
Computer SMART	0.15
Description	

General

Alarms

Condenser's battery.

1	Auto	2	Auto
3	Auto	4	Auto
5	Auto	6	Auto
7	Auto	8	Auto
9	Auto	10	Auto
11	Auto	12	Auto

Accept

Cancel

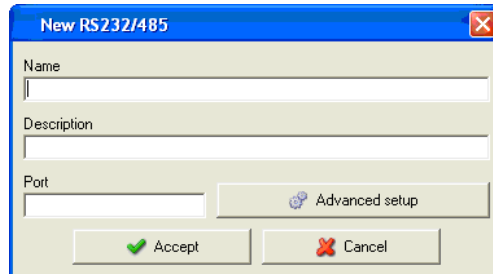
1	Auto
---	------

It shows the status of each of the 12 capacitors; the status can be Auto, On or Off.

1.15 RS232/485 converter

The RS232/485 converter connects equipment which works with an RS-485 serial connection to the port of the PC with an RS-232 connection.

When adding or modifying this device, see 'Editor Manual', the following dialogue appears



Where

- **Name:** Alphanumeric field that uniquely identifies the device throughout the program. There are no two devices in the configuration with the same name.
- **Description:** Alphanumeric type data to enter a brief description of the device.
- **Port:** Number of the serial port that the program uses for communication with the device.
- **Advanced communication:** Permits the configuration of a series of additional parameters on the device. Refer to 'Editor manual'.

1.16 TCP2RS converter:

The TCP2RS converter connects equipment units that work with serial communication (RS-232 / RS-485) to an Ethernet network using the IP protocol.

When adding or modifying this device, see 'Editor Manual', the following dialogue appears

The image shows a 'New TCP2RS' dialog box with the following fields and buttons:

- Name:** A text input field.
- Description:** A text input field.
- Converter address:** A text input field.
- Port:** A text input field containing '10001'.
- Configuration port:** A text input field containing '30718'.
- Buttons:** 'Setup' (with a gear icon), 'Advanced setup' (with a gear icon), 'Accept' (with a green checkmark icon), and 'Cancel' (with a red X icon).

Where

- **Name:** Alphanumeric field that uniquely identifies the device throughout the program. There are no two devices in the configuration with the same name.
- **Description:** Alphanumeric type data to enter a brief description of the device.
- **Address converter:** Corresponds to the address the program uses to communicate with the device. This parameter can be an IP address or a name. This address should not be confused with the MAC address.
- **Port:** Corresponds to the communications port:
- **Configuration port:** Corresponds to the communication port the program uses to configure the device. This port is 30718 by default.

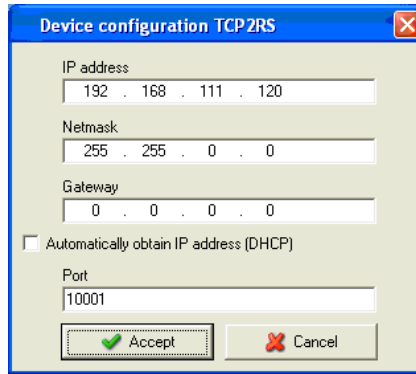


For a TCP2RS device to be able to communicate through a router, perform the following steps:

- 1-In the '*Address converter*' field enter the router's IP address.
- 2 - In the '*Port*' field enter the communications port and redirect this port on the router to the device's communications port.
- 3 - Redirect the configuration port on the router to port 30718 of the converter.

N.B.: For information on re-addressing ports consult the router user manual.

- **Parameters:** By clicking the button a dialogue will appear where a number of parameters of the device can be configured.



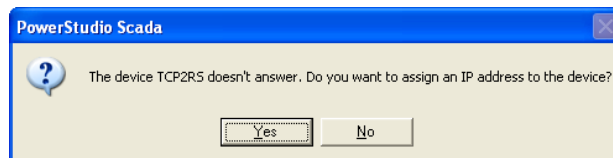
The dialog box is titled "Device configuration TCP2RS". It contains the following fields and options:

- IP address:** A text box containing "192 . 168 . 111 . 120".
- Netmask:** A text box containing "255 . 255 . 0 . 0".
- Gateway:** A text box containing "0 . 0 . 0 . 0".
- Automatically obtain IP address (DHCP):** An unchecked checkbox.
- Port:** A text box containing "10001".
- Buttons:** "Accept" (with a green checkmark icon) and "Cancel" (with a red X icon).

Where:

- *IP address:* Corresponds to the IP address used to communicate with the device.
 - *Subnetwork mask:* Corresponds to the subnetwork mask used on the network where the device is connected
 - *Predetermined Gateway:* Corresponds to the address of the gateway if the device is not on the same network as the computer containing the program.
 - *Obtain an IP address automatically (DHCP):* This option will be enabled when we want the device to automatically receive the IP address via a DHCP server.
 - *Port:* Corresponds to the device communications port.
- **Advanced communication:** Permits the configuration of a series of additional parameters on the device. Refer to 'Editor manual'.

On adding or modifying the device, the software will try to detect it. If it is unable to detect it, if the device is new or has not been allocated an IP address or has an allocated IP different to that entered in the 'Converter Address', it will ask if you want to assign a new IP address to the converter.



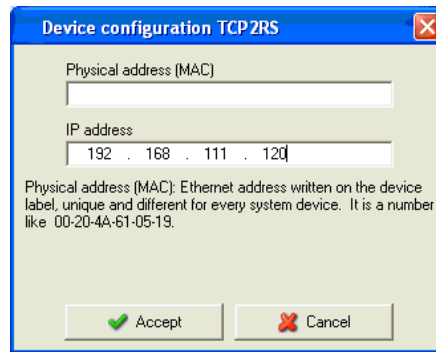
The dialog box is titled "PowerStudio Scada". It contains the following elements:

- Icon:** A question mark inside a blue circle.
- Text:** "The device TCP2RS doesn't answer. Do you want to assign an IP address to the device?"
- Buttons:** "Yes" and "No".



It will only be possible to assign an IP address to the device if it is on the same network as the computer running the program.

If the answer is 'Yes', the following dialogue box will appear, which will permit an IP address to be assigned to the device.



Where:

- **Physical address (MAC):** Ethernet address that each device has, which is unique and distinct on all network devices. The hardware address that any network interface has. Will be of the type 00-20-4A-61-05-19.
- **IP address:** IP Address to be allocated to the device that has the physical address introduced in the previous field.

If it is possible to assign an IP address to the converter, the following dialogue box will appear:



To finish setting up the rest of the parameters for communication with the device.

1.17 TCP2RS ModbusTCP converter

The TCP2RS converter connects equipment which works with serial communication (RS-232 / RS-485) to an Ethernet network using the IP protocol (ModbusTCP for connection-oriented communications).

When adding or modifying this device, see 'Editor Manual', the following dialogue appears

Where

- **Name:** Alphanumeric field that uniquely identifies the device throughout the program. There are no two devices in the configuration with the same name.
- **Description:** Alphanumeric type data to enter a brief description of the device.
- **Address converter:** Corresponds to the address the program uses to communicate with the device. This parameter can be an IP address or a name. This address should not be confused with the MAC address.
- **Port:** Corresponds to the communications port. By default the Modbus TCP protocol will communicate through port 502.
- **Configuration port:** Corresponds to the communication port the program uses to configure the device. This is port 30718 by default.



Unlike TCP2RS devices, the program does not configure any Modbus TCP device parameters automatically, using the configuration port only to detect and verify that the device configuration is correct. To configure or assign an IP address to Modbus TCP devices, consult the device manual.



For a TCP2RS device to be able to communicate through a router, perform the following steps:

- 1 – In the 'Address converter' field enter the router's IP address.
- 2 – In the 'Port' field enter the communications port and redirect this port on the router to the device's communications port.
- 3 – Redirect the configuration port on the router to port 30718 of the converter.

N.B.: For information on re-addressing ports consult the router user manual.



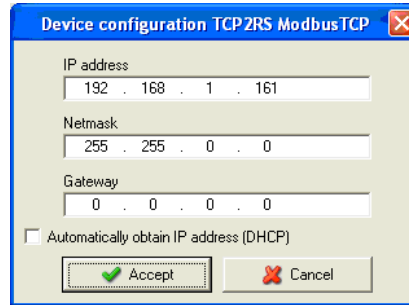
There are some second-tier devices that when connecting to a Modbus TCP device require manual configuration, the communication is limited to display, for Modbus TCP these devices cannot be configured. Devices of this nature are:

- CVM – B / BD

- CVMK
- CVMK – HAR

The special characteristics, as well as the pertinent configuration to carry out correct Modbus TCP connection are specified in the corresponding sections of each device.

- **Parameters:** Clicking the button will cause a dialogue will appear where a number of device parameters can be configured.



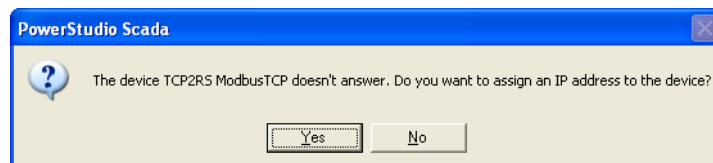
The dialog box titled "Device configuration TCP2RS ModbusTCP" contains the following fields and options:

- IP address:** A text field containing "192 . 168 . 1 . 161".
- Netmask:** A text field containing "255 . 255 . 0 . 0".
- Gateway:** A text field containing "0 . 0 . 0 . 0".
- Automatically obtain IP address (DHCP):** An unchecked checkbox.
- Buttons:** "Accept" (with a green checkmark icon) and "Cancel" (with a red X icon).

Where:

- *IP address:* Corresponds to the IP address used to communicate with the device.
- *Subnetwork mask:* Corresponds to the subnetwork mask used on the network where the device is connected
- *Predetermined Gateway:* Corresponds to the address of the gateway if the device is not on the same network as the computer containing the program.
- *Obtain an IP address automatically (DHCP):* This option will be enabled when we want the device to automatically receive the IP address via a DHCP server.
- **Advanced communication:** Permits the configuration of a series of additional parameters on the device. Refer to 'Editor manual'.

On adding or modifying the device, the software will try to detect it. If it is unable to detect it, if the device is new or has not been allocated an IP address or has an allocated IP different to that entered in the 'Converter Address', it will ask if you want to assign a new IP address to the converter.



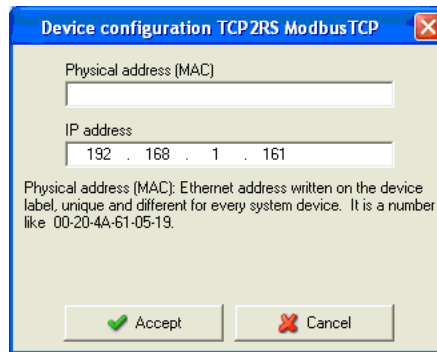
The dialog box titled "PowerStudio Scada" contains the following text and buttons:

- Text:** "The device TCP2RS ModbusTCP doesn't answer. Do you want to assign an IP address to the device?"
- Buttons:** "Yes" and "No".



It will only be possible to assign an IP address to the device if is on the same network as the computer running the program.

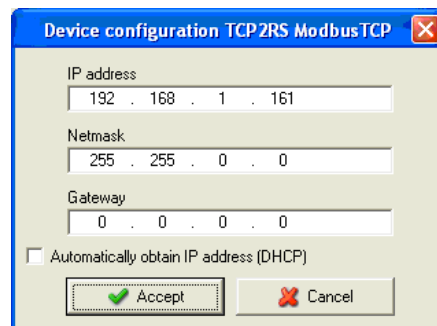
If the answer is 'Yes', the following dialogue box will appear, which will permit an IP address to be assigned to the device.



Where:

- **Physical address (MAC):** Ethernet address that each device has, which is unique and distinct on all network devices. The hardware address that any network interface has. Will be of the type 00-20-4A-61-05-19.
- **IP address:** IP Address to be allocated to the device that has the physical address introduced in the previous field.

If it is possible to assign an IP address to the converter, the following dialogue box will appear:



To finish setting up the rest of the parameters for communication with the device.

1.18 TCP2RS QNA RS485 converter

The TCP2RS QNA RS485 converter connects QNA devices which work with serial communications RS-485 on an Ethernet network using IP protocol.

Due to the peculiarities of the communication with QNA devices, only QNA-412 and QNA-413 second-level devices will be able to be connected to TCP2RS QNA RS485 first-level devices.

For more information on how to add and configure this device see section 1.17 TCP2RS converter:.

1.19 Generic UDP converter⁴

The generic UDP converter connects devices that use serial communications (RS-232/RS-485) to an Ethernet network using the IP protocol (UDP for datagram communications).

The screenshot shows a Windows-style dialog box titled "New Generic UDP". It has a blue title bar with a close button. The dialog contains four text input fields: "Name", "Description", "Converter address", and "Port". The "Port" field is pre-filled with "10001". To the right of the "Port" field is a button labeled "Advanced setup" with a gear icon. At the bottom of the dialog are two buttons: "Accept" with a green checkmark icon and "Cancel" with a red X icon.

Where

- **Name:** Alphanumeric field that uniquely identifies the device throughout the program. There are no two devices in the configuration with the same name.
- **Description:** Alphanumeric type data to enter a brief description of the device.
- **Address converter:** Corresponds to the address the program uses to communicate with the device. This parameter can be an IP address or a name. This address should not be confused with the MAC address.
- **Port:** Corresponds to the communications port:
- **Advanced communication:** Permits the configuration of a series of additional parameters on the device. Refer to 'Editor manual'.



Due to the large number of converters that can be found on the market. On adding this device the program will not attempt to detect or verify that the configuration is correct.

The configuration and the proper functioning of communications between the converter and the program is the responsibility of user.

For more information on how to configure the converter consult the device manual.

⁴ Only in Deluxe version

1.20 Generic TCP converter⁵

The generic TCP converter connects devices that work with serial communication (RS-232/RS-485) to an Ethernet network using the IP protocol (TCP for connection-oriented communications).



Due to the large number of converters that can be found on the market. On adding this device the program will not attempt to detect or verify that the configuration is correct.

The configuration and the proper functioning of communications between the converter and the program is the responsibility of user.

For more information on how to configure the converter consult the device manual.

For more information on how to configure this converter see section 1.20 Generic UDP converter.

⁵ Only in Deluxe version

1.21 ModbusTCP generic converter⁶

The ModbusTCP generic converter connects devices that work with serial communication (RS-232/RS-485) to an Ethernet network using the IP protocol (ModbusTCP for connection-orientated communications).



Due to the large number of converters that can be found on the market. On adding this device the program will not attempt to detect or verify that the configuration is correct.

The configuration and the proper functioning of communications between the converter and the program is the responsibility of user.

For more information on how to configure the converter consult the device manual.

For more information on how to configure this converter see section 1.20 Generic UDP converter.

⁶ Only in Deluxe Version

1.22 CVM-144

1.22.1 Driver options

Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.22.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on 'Accept' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

Driver configuration CVM-144

Device Information Peripheral number: 5 Model: CVM-144 III Identifier: CVM144 Version: 6.15 Description:		Password <input type="checkbox"/> Enable password Password: <input type="text"/> Repeat password: <input type="text"/>	Maximeter Period: 15 Window type: Fixed Unit: Active power III <input type="button" value="Maximeter reset"/>																												
Alarms <table border="1"> <thead> <tr> <th></th> <th>Variable</th> <th>Maximum</th> <th>Minimum</th> <th>Delay</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Voltage L1 (V)</td> <td>100</td> <td>0</td> <td>0</td> </tr> <tr> <td>2</td> <td>Voltage L2 (V)</td> <td>240</td> <td>220</td> <td>0</td> </tr> </tbody> </table>			Variable	Maximum	Minimum	Delay	1	Voltage L1 (V)	100	0	0	2	Voltage L2 (V)	240	220	0	Transformation ratio <table border="1"> <thead> <tr> <th></th> <th>Primary</th> <th>Secondary</th> </tr> </thead> <tbody> <tr> <td>Voltage</td> <td>2</td> <td>1</td> </tr> <tr> <td>Current</td> <td>5</td> <td>5</td> </tr> </tbody> </table>			Primary	Secondary	Voltage	2	1	Current	5	5				
	Variable	Maximum	Minimum	Delay																											
1	Voltage L1 (V)	100	0	0																											
2	Voltage L2 (V)	240	220	0																											
	Primary	Secondary																													
Voltage	2	1																													
Current	5	5																													
Analog outputs <table border="1"> <thead> <tr> <th></th> <th>Variable</th> <th>Zero</th> <th>Fullscale</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Voltage L1 (V)</td> <td>229</td> <td>232</td> <td>0-20mA</td> </tr> <tr> <td>2</td> <td>Reactive power L1 (kVar)</td> <td>125</td> <td>323</td> <td>4-20mA</td> </tr> <tr> <td>3</td> <td>Current L3 (A)</td> <td>5</td> <td>9</td> <td>0-20mA</td> </tr> <tr> <td>4</td> <td>Active power L1 (kW)</td> <td>65</td> <td>323</td> <td>0-20mA</td> </tr> </tbody> </table>			Variable	Zero	Fullscale	Type	1	Voltage L1 (V)	229	232	0-20mA	2	Reactive power L1 (kVar)	125	323	4-20mA	3	Current L3 (A)	5	9	0-20mA	4	Active power L1 (kW)	65	323	0-20mA	Distortion calculation <input checked="" type="radio"/> THD (Effective value) <input type="radio"/> D (fundamental)				
	Variable	Zero	Fullscale	Type																											
1	Voltage L1 (V)	229	232	0-20mA																											
2	Reactive power L1 (kVar)	125	323	4-20mA																											
3	Current L3 (A)	5	9	0-20mA																											
4	Active power L1 (kW)	65	323	0-20mA																											
Analog inputs <table border="1"> <thead> <tr> <th></th> <th>Variable</th> <th>Units</th> <th>Zero</th> <th>Fullscale</th> <th>Type</th> <th>Decimal point</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Var1</td> <td>unit1</td> <td>0</td> <td>1000</td> <td>4-20mA</td> <td>999.9</td> </tr> <tr> <td>2</td> <td>Var2</td> <td>unit2</td> <td>0</td> <td>100</td> <td>0-20mA</td> <td>99.99</td> </tr> <tr> <td>3</td> <td>Var3</td> <td>unit3</td> <td>0</td> <td>10</td> <td>4-20mA</td> <td>9.999</td> </tr> </tbody> </table>			Variable	Units	Zero	Fullscale	Type	Decimal point	1	Var1	unit1	0	1000	4-20mA	999.9	2	Var2	unit2	0	100	0-20mA	99.99	3	Var3	unit3	0	10	4-20mA	9.999	Earth leakage current <input checked="" type="radio"/> 3A <input type="radio"/> 30A <input type="button" value="Reset"/>	
	Variable	Units	Zero	Fullscale	Type	Decimal point																									
1	Var1	unit1	0	1000	4-20mA	999.9																									
2	Var2	unit2	0	100	0-20mA	99.99																									
3	Var3	unit3	0	10	4-20mA	9.999																									
		Neutral current Transformation ratio: 2																													

Depending on the device connected, some fields will be disabled.

Device Information	
Peripheral number	Model
5	CVM-144 III
Identifier	Version
CVM144	6.15
Description	

Displays general information.

Password

☐ Enable password

Password

Repeat password

Allows the password to be enabled or disabled to lock the keyboard configuration of the device.

Maximeter

Period: 15

Window type: Fixed

Unit: Active power III

Maximeter reset

- **Period:** The integration period of the maximeter, which can vary between 1 and 60 minutes.
- **Window type:** Type of window used to save the maximeter value, this can be fixed or sliding.
- **Unit:** The maximum demand can be calculated with active power III, apparent power III, current III or current by phase depending on the device.
- **Maximeter reset:** When the button is pressed, the device maximeter goes to zero.

Alarms				
	Variable	Maximum	Minimum	Delay
1	Voltage L1 (V)	100	0	0
2	Voltage L2 (V)	240	220	0

This section shows the configuration of the device relay outputs, configuration is possible with the required values.

- **Variable:** The parameters associated with the relay are indicated in this field. The output is programd as an alarm, allowing any of the parameters measured by the CVM-144 to be controlled. The units in which the maximum and minimum values of the alarm are expressed are indicated in brackets.
- **Max:** This box indicates the maximum value to be controlled.
- **Min:** This box indicates the minimum value to be controlled.
- **Delay:** Delay in seconds of the alarm. The maximum value is 9999 seconds.

Transformation ratio		
	Primary	Secondary
Voltage	2	1
Current	5	5

- **Voltage transformation ratio:** Primary and secondary voltage programming. The product between the primary value and the primary current must be the same as or less than 20,000,000. The primary value, depending on fullscale, must be between 1 and the value of the following table:

Full-scale	Maximum value.
110v	99.999
275v	70.000
300v	70.000
500v	40.000

- **Current transformation ratio:** This is the device primary current value. Value may be between 1 and 10,000 A. The secondary current is 5A in the CVM-144.

Analog outputs				
	Variable	Zero	Fullscale	Type
1	Voltage L1 (V)	229	232	0-20mA
2	Reactive power L1 (kVar)	125	323	4-20mA
3	Current L3 (A)	5	9	0-20mA
4	Active power L1 (kW)	65	323	0-20mA

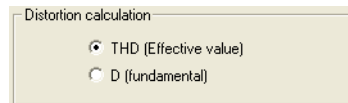
This section shows the configuration of the device analogue outputs, and the option is given to configure them with the desired values.

- **Variable:** Permits any parameter measured by the CVM-144 to be selected, except parameters corresponding to energy.
- **Full scale:** Value of the parameter to which the zero of the scale is assigned.
- **Full scale:** Value of the parameter to which the maximum value of the scale is assigned.
- **Type:** Output type, allows outputs 0 – 20 mA, 4 – 20 mA or 0 – 10 V to be chosen, depending on the device.

Analog inputs						
	Variable	Units	Zero	Fullscale	Type	Decimal point
1	Var1	unit1	0	1000	4-20mA	999.9
2	Var2	unit2	0	100	0-20mA	99.99
3	Var3	unit3	0	10	4-20mA	9.999

- **Variable:** This indicates the name associated with the analogue input.
- **Units:** This indicates the type of units the variable represents.
- **Full scale:** Value of the parameter to which the zero of the scale is assigned.
- **Full scale:** Value of the parameter to which the maximum value of the scale is assigned.
- **Type:** Input type, allows inputs of 0 – 20 mA, 4 – 20 mA or 0 – 10 V to be chosen, depending on the device.
- **Decimal point:** Position of the decimal point. Only if the device allows us to display the analogue inputs with real measurement values.

PowerStudio

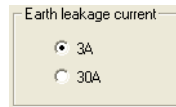


Distortion calculation

☒ THD (Effective value)

☐ D (fundamental)

Using this selector the type of distortion that the device will calculate can be configured.

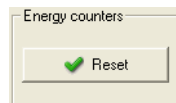


Earth leakage current

☒ 3A

☐ 30A

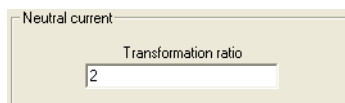
Using this, the differential current of the device can be configured. Only for those devices that can measure differential current.



Energy counters

☒ Reset

Clicking the button will reset the energy counters on the device to zero.



Neutral current

Transformation ratio

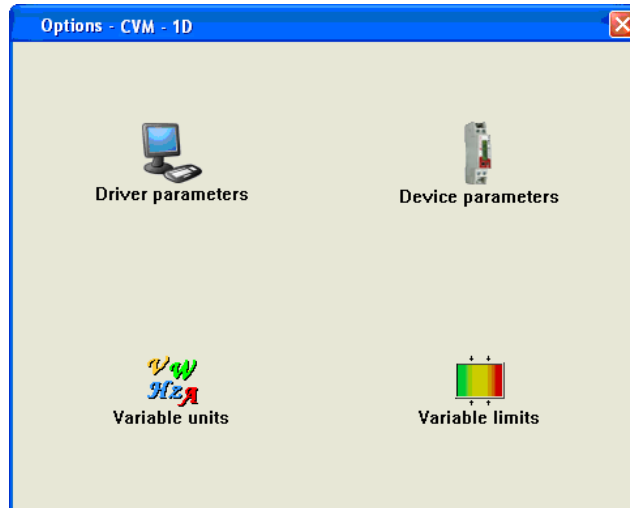
2

Neutral current transformation ratio configuration. Only for those devices that can differential current.

1.23 CVM- 1D

1.23.1 Driver options

Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.23.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

CVM - 1D configuration

Device Information

Peripheral number 32	Model CVM - 1D
Identifier CVM 1D	Description

Maximeter

Unit:

Period:

Number of quadrants: ☐ 2 ☒ 4

Output: ☒ Pulses ☐ Alarm

Pulses

Unit:

Output pulse width:

Output pulses active energy relation:

Alarm

Unit:

Maximum: Minimum:

Delay in deactivating (seconds):

PowerStudio

Device Information	
Peripheral number	Model
32	CVM - 1D
Identifier	Description
CVM 1D	

Displays general information about the device.

Maximeter
Unit
<div>Current</div>
Period
15
<div>✖ Maximeter reset</div>

- **Period:** Maximeter integration period, which can vary between 1 and 60 minutes.
- **Unit:** Maximum demand can be calculated using the active or current power.
- **Maximeter reset:** Pushing the button resets the maximeter to zero.

Number of quadrants
<div><input type="radio"/> 2 <input checked="" type="radio"/> 4</div>

This allows you to select the number of quadrants to use for the output of pulses. With only two quadrants you can select the energy consumed, with four quadrants you can select the energy consumed and generated.

Output
<div><input checked="" type="radio"/> Pulses <input type="radio"/> Alarm</div>

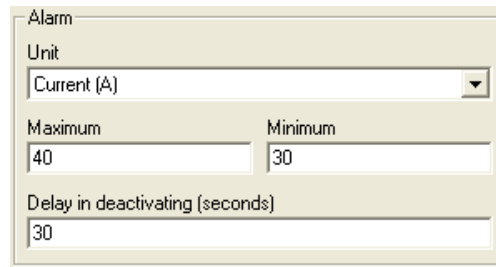
Select the output you would like to use, only one can be active.

Pulses
Unit
<div>Active energy (+)</div>
Output pulse width
400
Output pulses active energy relation
100

Pulse output. This option will be activated on selecting pulse output.

- **Unit:** Allows you to select between active and reactive energy. If two quadrants are selected, you can only select the energy consumed; however, if four quadrants have been selected, you can select the energy consumed and generated.
- **Output pulse width:** The values will be between 100 and 4000 ms.
- **Output pulse active energy ratio:** The number of pulses/kWh must be between 1 and 100.

PowerStudio



Alarm

Unit
Current (A)

Maximum Minimum
40 30

Delay in deactivating (seconds)
30

Alarm output. This option will be activated on selecting the alarm output.

- **Unit:** Allows you to select between the voltage, current, powers, power factor, and maximeter.
- **Max:** Maximum alarm value.
- **Min:** Minimum alarm value.
- **Delay in deactivating (seconds):** Value between 0 and 60 seconds.

1.24 CVM-96

1.24.1 Driver options

Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.24.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

CVM-96 configuration

Device Information Peripheral number: 5 Identifier: CVM-96 Description:		Model : CVM-96 Version : 6.16																			
Transformation ratio <table border="1"> <thead> <tr> <th></th> <th>Primary</th> <th>Secondary</th> </tr> </thead> <tbody> <tr> <td>Voltage</td> <td>1</td> <td>2</td> </tr> <tr> <td>Current</td> <td>5</td> <td>5</td> </tr> </tbody> </table>			Primary	Secondary	Voltage	1	2	Current	5	5	Password <input type="checkbox"/> Enable password Password: <input type="text"/> Repeat password: <input type="text"/>										
	Primary	Secondary																			
Voltage	1	2																			
Current	5	5																			
Distortion calculation <input checked="" type="radio"/> THD (Effective value) <input type="radio"/> D (fundamental)		Maximeter Period: 1 Unit: Current per phase <input type="button" value="Maximeter reset"/>																			
Alarms <table border="1"> <thead> <tr> <th></th> <th>Variable</th> <th>Maximum</th> <th>Minimum</th> <th>Delay</th> <th>Delay off</th> </tr> </thead> <tbody> <tr> <td>Alarm 1</td> <td>Voltage L1 (V)</td> <td>100</td> <td>50</td> <td>1</td> <td>0</td> </tr> <tr> <td>Alarm 2</td> <td>Voltage L2 (V)</td> <td>50</td> <td>10</td> <td>0</td> <td>0</td> </tr> </tbody> </table>			Variable	Maximum	Minimum	Delay	Delay off	Alarm 1	Voltage L1 (V)	100	50	1	0	Alarm 2	Voltage L2 (V)	50	10	0	0	Energy counters <input type="button" value="Reset"/>	
	Variable	Maximum	Minimum	Delay	Delay off																
Alarm 1	Voltage L1 (V)	100	50	1	0																
Alarm 2	Voltage L2 (V)	50	10	0	0																
<input type="button" value="Accept"/> <input type="button" value="Cancel"/>																					

PowerStudio

Device Information	
Peripheral number	Model
5	CVM-96
Identifier	Version
CVM-96	6.16
Description	

Shows general information.

Password
☐ Enable password
 Password

 Repeat password

Enables the password to be enabled or deactivated to block the configuration of the device by means of the keyboard.

Transformation ratio		
	Primary	Secondary
Voltage	1	2
Current	5	5

Depending on the version connected, programming of the voltage transformation ratio can be disabled.

- Voltage transformation ratio:** Primary and secondary voltage programming. The product of the primary value and the primary current must be the same as or less than 20,000,000. The value of the primary, depending on the fullscale of the equipment, must be between 1 and the corresponding value from the following table:

Full-scale	Maximum value.
110v	99.999
275v	70.000
300v	70.000
500v	40.000

- Current transformation ratio:** This is the device primary current value. Value may be between 1 and 10,000 A. The secondary current is 5A in the CVM-96.

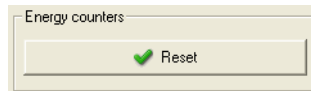
Maximeter
 Period

 Unit
 Current per phase

- Period:** Is the maximeter integration period can vary between 1 and 60 minutes.
- Unit:** The maximum demand can be calculated with active power III, apparent power III, current III or current by phase depending on the device.
- Maximeter reset:** When the button is pressed, the device maximeter resets to zero.

Distortion calculation
☒ THD (Effective value)
☐ D (fundamental)

Use this selector to configure the type of distortion the device will calculate.



Clicking the button will reset the energy counters on the device to zero.

Alarms					
	Variable	Maximum	Minimum	Delay	Delay off
Alarm 1	Voltage L1 (V)	100	50	1	0
Alarm 2	Voltage L2 (V)	50	10	0	0

This section shows the configuration of the device relay outputs, configuration is possible with the required values.

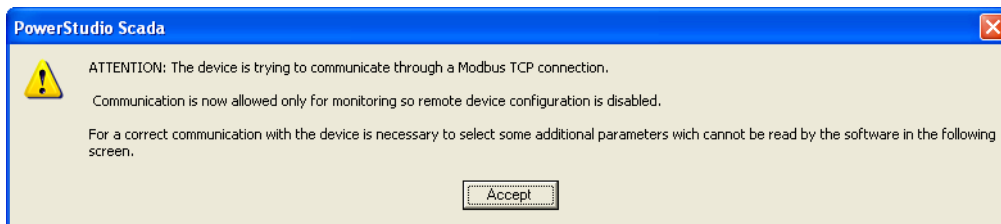
- **Variable:** The parameters associated with the relay are indicated in this field. The output is programd as an alarm, and can control any of the parameters measured by the CVM-96. The maximum and minimum alarm unit values are indicated in brackets.
- **Max:** This box indicates the maximum value to be controlled.
- **Min:** This box indicates the minimum value to be controlled.
- **Delay:** Alarm delay in seconds. The maximum value is 9999 seconds.

1.25 CVM-B/BD

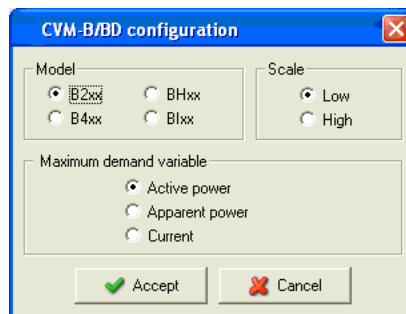
1.25.1 Modbus TCP connection

The CVM-B/BD devices can connect with MODBUSTCP connections with some limitations. PowerStudio can read the values measured by the device but cannot read the configuration. Although it is not possible to read the configuration, for the correct value display, PowerStudio needs to know certain information about the device. This information should be entered by the user, and it will be the responsibility of the user to ensure that the data corresponds to the device connected. If this data introduced by the user were incorrect it could give communication errors making it impossible for PowerStudio to show the values measured by the device.

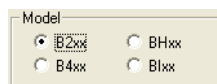
When adding a device on a MODBUSTCP connection, see section , PowerStudio displays the following warning:



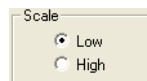
Then a dialogue box will appear with the information PowerStudio needs to communicate with the device.



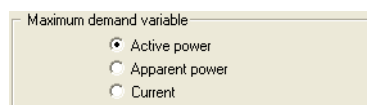
The user must select the correct information corresponding to the device connected.



Device model. Using the model, PowerStudio can ascertain which variables are measured by the device thus avoiding variables not possessed by the device being asked for.



Variables measurement scale. This will be used by PowerStudio for the correct display of values shown on screen



Variable used to calculate the maximum demand.

1.25.2 Driver options

Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.25.2.1 Device parameters



It is not possible to configure the device when it communicates via the MODBUSTCP connection.

This screen allows the internal parameters of the device to be configured. Upon opening the dialogue box, the software will read the device configuration. When complete, click on 'Accept' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

CVM-B/BD configuration

Device Information Peripheral number: 42 Identifier: CVM-BD Description:		Model: CVM-B/BD 4 Version: B40F	
--	--	------------------------------------	--

Transformation ratio			
Scale	Low		
	Primary	Secondary	
Voltage	220	/ 220	
Current	1000	/ 5	

Maximeter Period: 1 Window type: Fixed Unit: Active power III <input type="button" value="Maximeter reset"/>	Energy counters			
		Tariff 1	Tariff 2	Tariff 3
	Active energy	580611	188121	119775
	Inductive energy	0	0	0
	Capacitive energy	184837	59775	38071
	Active energy -	298012430	69632502	229368627
	Inductive energy -	0	0	0
	Capacitive energy -	130414598	30307830	100200450
<input type="checkbox"/> Load values in device meters				

Alarms				
	Variable	Maximum	Minimum	Delay
Alarm 1	Voltage L1 (V)	0	0	0
	Variable	Maximum	Minimum	Delay
Alarm 2	Voltage L2 (V)	0	0	0

Analog outputs				
	Variable	Zero	Fullscale	Type
Output 1	Current L3 (A)	0	0	
Output 2	Active power L1 (kW)	0	0	

PowerStudio

Device Information	
Peripheral number	Model
42	CVM-B/BD 4
Identifier	Version
CVM-BD	B40F
Description	

Displays general information.

Transformation ratio		
Scale	Low	
	Primary	Secondary
Voltage	220	/ 220
Current	1000	/ 5

- **Voltage transformation ratio:** Primary and secondary voltage programming. The primary voltage value should be between 1 and 500000 V and the secondary between 1 and 999. In addition the primary divided by the secondary must be less than 9090.
- **Primary current transformer:** This is the device primary current value. Value may be between 1 and 10000 A. Secondary current in the CVM-K is 5A .

Maximeter	
Period	1
Window type	Fixed
Unit	Active power III
<input type="button" value="✖ Maximeter reset"/>	

- **Period:** This is the maximeter integration period and can vary between 1 and 60 minutes.
- **Window type:** Type of window used to save the maximeter value, this can be fixed or sliding.
- **Unit:** Maximum demand can be calculated with active voltage III, apparent voltage III, or current III.
- **Maximeter reset:** Pushing the button resets the maximeter to zero.

Energy counters			
	Tariff 1	Tariff 2	Tariff 3
Active energy	580611	188121	119775
Inductive energy	0	0	0
Capacitive energy	184837	59775	38071
Active energy -	298012430	69632502	229368627
Inductive energy -	0	0	0
Capacitive energy -	130414598	30307830	100200450
<input type="checkbox"/> Load values in device meters			

This part of the configuration corresponds to device energies. Depending on the type of device some or all of the fields can be deactivated. ☒ If the selector is checked, sending the configuration will load the energy counter with the values entered into the corresponding boxes.

Alarms				
	Variable	Maximum	Minimum	Delay
Alarm 1	Voltage L1 (V)	0	0	0
	Variable	Maximum	Minimum	Delay
Alarm 2	Voltage L2 (V)	0	0	0

If the connected device has relay outputs, they can be configured with the values desired.

- **Variable:** Parameter associated to the output relay. The output is programmed with an alarm, making it possible to control any of the parameters measured by the CVM-B/BD. The maximum and minimum alarm unit values are indicated in brackets.
- **Max:** This box indicates the maximum value to be controlled.
- **Min:** This box indicates the minimum value to be controlled.
- **Delay:** Alarm delay in seconds. The maximum value is 9999 seconds.

Analog outputs				
	Variable	Zero	Fullscale	Type
Output 1	Current L3 (A)	0	0	
Output 2	Active power L1 (kW)	0	0	

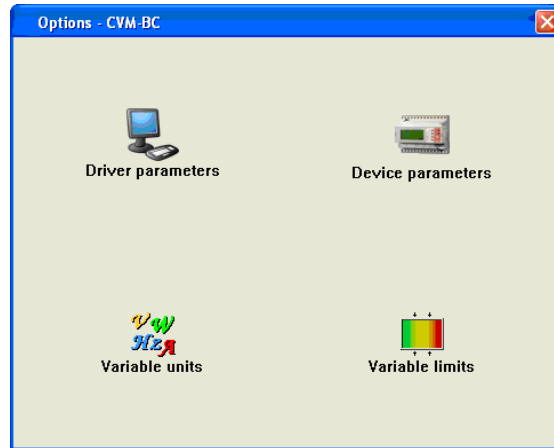
If the device has analogue outputs, the desired values can be configured.

- **Variable:** Parameter associated to the analogue output. Any parameter measured by the CVM-B/BD can be selected as an analogue output.
- **Zero:** Value of the parameter to which the zero of the scale is assigned.
- **Fullscale:** Value of the parameter to which maximum value of the scale is assigned.
- **Type:** Type of input, permits either 0-20 mA or 4-20 mA to be chosen.

1.26 CVM-BC

1.26.1 Driver options

Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.26.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. Upon opening the dialogue box, the software will read the device configuration. When complete, click on 'Accept' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

 A screenshot of the 'CVM-BC configuration' dialog box. It has a blue title bar with the text 'CVM-BC configuration' and a close button. The main area is light beige and contains several sections:

- Device Information:** A table with two columns. The first column contains 'Peripheral number' (14), 'Identifier' (CVM-BC), and 'Description'. The second column contains 'Model' (CVM-BC) and 'Version' (4.03).
- Transformation ratio:** A section with two columns: 'Primary' and 'Secondary'. Under 'Primary', 'Voltage' is 1 and 'Current' is 9000. Under 'Secondary', 'Voltage' is 1 and 'Current' is 5.
- Distortion calculation:** Two radio buttons: 'THD (Effective value)' (selected) and 'D (fundamental)'.
- Alarms:** A table with columns: 'Variable', 'Maximum', 'Minimum', 'Delay', and 'Delay off'.

	Variable	Maximum	Minimum	Delay	Delay off
Alarm 1	Voltage L1 (V)	2	0	0	0
Alarm 2	Current L2 (A)	0	0	0	0
- Password:** A section with a checkbox 'Enable password' (unchecked), a 'Password' field, and a 'Repeat password' field.
- Maximeter:** A section with 'Period' (1), 'Window type' (Fixed), 'Unit' (Active power III), and a 'Maximeter reset' button.
- Energy counters:** A section with a 'Reset' button.

 At the bottom, there are two buttons: 'Accept' (with a green checkmark icon) and 'Cancel' (with a red X icon).

PowerStudio

Device Information	
Peripheral number	Model
14	CVM-BC
Identifier	Version
CVM-BC	4.03
Description	

Displays general information.

Enable password

☐ Enable password

☐ Disable password

☐ Enable password

☐ Disable password

☐ Enable password

☐ Disable password

Enables the password to be enabled or deactivated to disable configuration of the device using the keyboard.

	Primary	Secondary
Voltage	1	1
Current	9000	5

Depending on the version connected, programming of the voltage transformation ratio can be disabled.

- Voltage transformation ratio:** Primary and secondary voltage programming. The product between the primary value and the primary current must be the same as or less than 20.000.000. The primary value, depending on fullscale, must be between 1 and the value of the following table:

Full-scale	Maximum value.
110v	99.999
275v	70.000
300v	70.000
500v	40.000

- Current transformation ratio:** This is the device primary current value. Value may be between 1 and 10,000 A. Secondary current in the CVM-K is 5A .

Period

1

Window type

Fixed

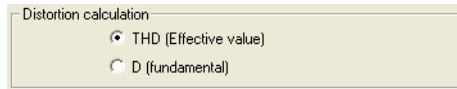
Unit

Active power III

Maximeter reset

- Period:** This is the maximeter integration period and can vary between 1 and 60 minutes.
- Window type:** Type of window used to save the maximeter value, this can be fixed or sliding.
- Unit:** The maximum demand can be calculated with active power III, apparent power III, current III or current by phase depending on the device.
- Maximeter reset:** Pushing the button resets the maximeter to zero.

PowerStudio




Distortion calculation


☒ THD (Effective value)

☐ D (fundamental)

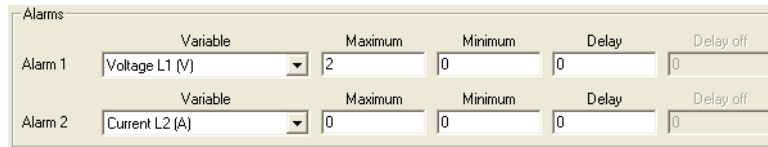
Use this selector to configure the type of distortion the device will calculate.



Energy counters

 Reset

Clicking the button will reset the energy counters on the device to zero.



Alarms						
	Variable	Maximum	Minimum	Delay	Delay off	
Alarm 1	Voltage L1 (V)	2	0	0	0	
Alarm 2	Current L2 (A)	0	0	0	0	

This section shows configuration of the device relay outputs, which may be configured as desired.

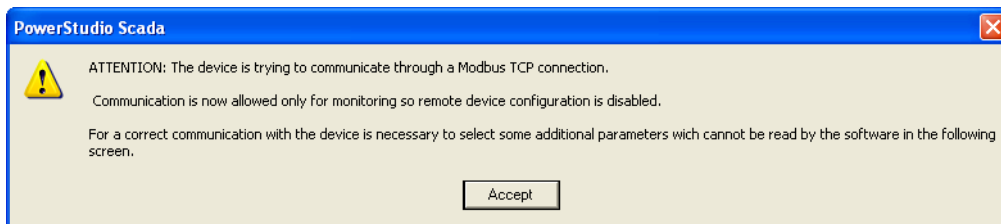
- **Variable:** The parameters associated with the relay are indicated in this field. The output is programmed as an alarm and any of the parameters measured by the CVM-BC can be controlled. The maximum and minimum alarm unit values are indicated in brackets.
- **Max:** In this box the maximum value to control is indicated.
- **Min:** This box indicates the minimum value to be controlled.
- **Delay:** Alarm delay in seconds. The maximum value is 9999 seconds.

1.27 CVM-K

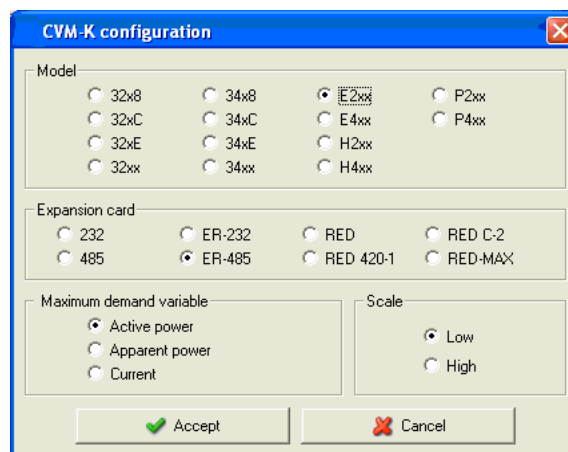
1.27.1 Connection with modbus TCP

The CVM-K devices can connect on MODBUSTCP connections with some limitations. PowerStudio can read the values measured by the device but cannot read the configuration. Although it is not possible to read the configuration, for the correct value display, PowerStudio needs to know certain information about the device. This information should be entered by the user, and it will be the responsibility of the user to ensure that the data corresponds to the device connected. If this data introduced by the user were incorrect it could give communication errors making it impossible for PowerStudio to show the values measured by the device.

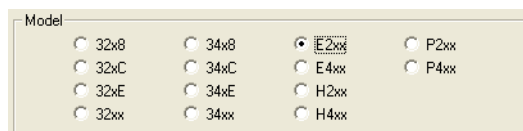
When adding a device on a MODBUSTCP connection, see section 1.18 TCP2RS ModbusTCP converter, PowerStudio displays the following warning:



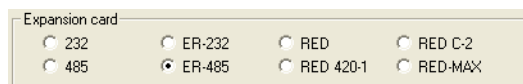
Then a dialogue box will appear with the information PowerStudio needs to communicate with the device.



The user must select the correct information corresponding to the device connected.

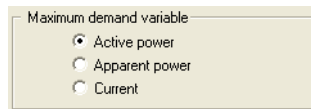


Device model. Using the model, PowerStudio can determine which variable the device measures and avoid requesting those it does not.

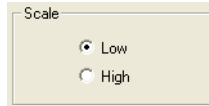


Expansion card.

PowerStudio



Variable used to calculate the maximum demand.



Variables measurement scale. This will be used by PowerStudio for the correct display of values shown on screen

1.27.2 Driver options

Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.27.2.1 Device parameters



It is not possible to configure the device when it communicates via the MODBUSTCP connection.

This screen allows the internal parameters of the device to be configured. Upon opening the dialogue box, the software will read the device configuration. When complete, click on 'Accept' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

CVM-K configuration

Device Information		Transformation ratio	
Peripheral number 2	Model CVM-K4 (RED 420-1)	Scale Low	
Identifier CVM K 2	Version E419	Voltage	Primary: 1 / Secondary: 1
Description CVM K 2		Current	10000 / 5

Maximeter	Energy counters
Period 1	
Window type Sliding	
Unit Active power III	
Maximeter reset	

Alarms				
	Variable	Maximum	Minimum	Delay
Alarm 1	Voltage L1 (V)	240	200	0
Alarm 2	Voltage L2 (V)	0250	190	0

Analog outputs				
	Variable	Zero	Fullscale	Type
Output 1	Voltage L1 (V)	0	500	0 - 20 mA

Accept Cancel

Device Information

Peripheral number 2	Model CVM-K4 (RED 420-1)
Identifier CVM K 2	Version E419
Description CVM K 2	

Displays general information.

Transformation ratio

Scale Low	
Voltage	Primary: 1 / Secondary: 1
Current	10000 / 5

- **Voltage transformation ratio:** Primary and secondary voltage programming. The primary voltage value should be between 1 and 500000 V and the secondary between 1 and 999 V. In addition the primary divided by the secondary must be less than 9090.
- **Primary current transformer:** This is the device primary current value. Value may be between 1 and 10,000 A. Secondary current in the CVM-K is 5A .

Maximeter

Period 1
Window type Sliding
Unit Active power III
Maximeter reset

- **Period:** This is the maximeter integration period and can vary between 1 and 60 minutes.

- **Window type:** Type of window used to save the maximeter value, this can be fixed or sliding.
- **Unit:** Maximum demand can be calculated with active voltage III, apparent voltage III, or current III.
- **Maximeter reset:** Pushing the button resets the maximeter to zero.

Energy counters			
	Tariff 1	Tariff 2	Tariff 3
Active energy	4319441	0	0
Inductive energy	0	0	0
Capacitive energy	394491	0	0
Active energy -	0	0	0
Inductive energy -	0	0	0
Capacitive energy -	0	0	0

☐ Load values in device meters

This part of the configuration corresponds to device energies. Depending on the type of device some or all of the fields can be deactivated. ☒ If the selector is checked, sending the configuration energy meter will load the energy counter with the values entered into the corresponding boxes.

Alarms				
	Variable	Maximum	Minimum	Delay
Alarm 1	Voltage L1 (V)	240	200	0
Alarm 2	Voltage L2 (V)	0250	190	0

If the connected device has relay outputs, they can be configured with the values desired.

- **Variable:** Parameter associated to the output relay. The output is programmed as an alarm, controlling any of the parameters measured by the CVM-K. The maximum and minimum alarm unit values are indicated in brackets.
- **Max:** This box indicates the maximum value to be controlled.
- **Min:** This box indicates the minimum value to be controlled.
- **Delay:** Alarm delay in seconds. The maximum value is 9999 seconds.

Analog outputs				
	Variable	Zero	Fullscale	Type
Output 1	Voltage L1 (V)	0	500	0 - 20 mA

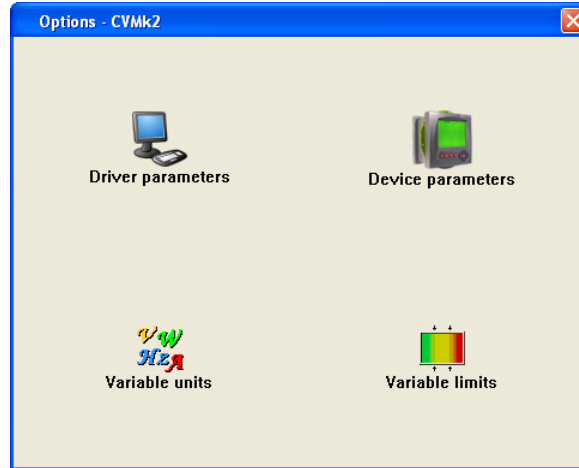
If the device has analogue outputs, the desired values can be configured.

- **Variable:** Parameter associated to the analogue output. Any parameter measured by the CVM-K can be selected as an analogue output.
- **Zero:** Value of the parameter to which the zero of the scale is assigned.
- **Fullscale:** Value of the parameter to which maximum value of the scale is assigned.
- **Type:** Type of input, permits either 0-20 mA or 4-20 mA to be chosen.

1.28 CVM-K2

1.28.1 Driver options

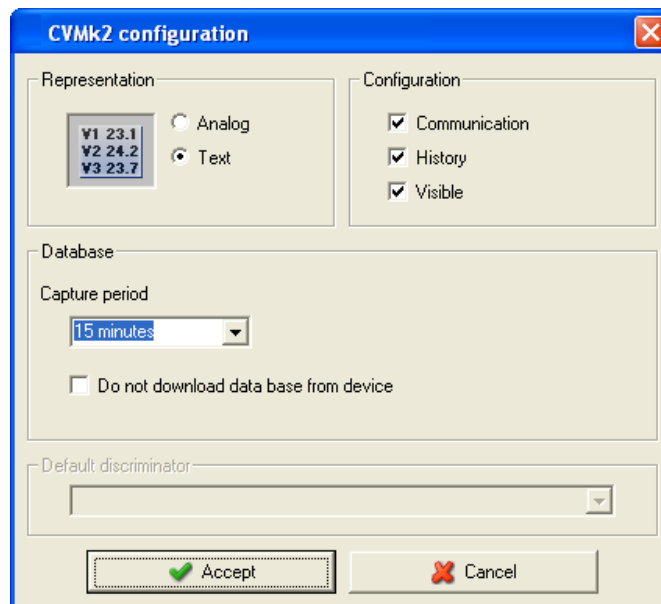
Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

The "Expansion Card" options will depend on the expansion card inserted in the device.

1.28.1.1 Driver Parameters



For the device driver, CVMK2 has added an option to disable downloading of the database generated by the equipment. If this option is chosen the instantaneous data file will not download from the equipment, nor will EVQ files or SD cards exist. The remaining screen parameters are detailed in section 1.1.1 Driver parameters.

When the device has an 'SD Memory' expansion card inserted, the data capture period is configured using the "Device parameters" option.

1.28.1.2 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

CVMk2 configuration

Device Information

Peripheral number 1	Model CVMk2-ITF-405
Identifier cvmk2	Version -1p09
Description	

Device

Measure point
CVMk2

Capture period
1

Reset

Synchronise clock

Transformation ratio

	Primary	Secondary
Voltage	1	1
Current	1000	5
Neutral current	5	

Maximeter

Period
15

Window type
Sliding

Maximeter reset

Nominal frequency

50 Hz
60 Hz

Distortion calculation

RMS
Fundamental

Temperature

°C
°F

Tariffs

Synchronism type
Internal clock
Digital inputs

Number of tariffs
9

Alarm date form change tariff
11/08/2011 12:34:50

Calendar

First synchronism input
Expansion card 2 - Digital input 1

Accept Cancel

SD memory

Digitals 8 Inputs / 8 Outputs

Expansion card 3

Device Information

Peripheral number 1	Model CVMk2-ITF-405
Identifier cvmk2	Version -1p09
Description	

Displays general information.

Device

Measure point
CVMk2

Capture period (min.)
10

Reset

Synchronise clock

- **Measuring point:** Short description of the device for display and better identification on the device screen.

- **Capture period:** Data capture period, in minutes, for generation of log values when the equipment has an expansion card inserted in the memory.
- **Initialise energy meters:** Click to reset the energy device meters
- **Synchronise clock:** Click to synchronise device date and time to the PC date and time.

Transformation ratio

	Primary		Secondary
Voltage	100	/	1
Current	50	/	5
Neutral current	5		

Programming the device voltage transformation ratios, current and neutral current.

Maximeter

Period: 15

Window type: Sliding

Maximeter reset

- **Period:** Maximeter integration period, which can vary between 1 and 60 minutes.
- **Window type:** Type of window used to save the maximeter value, this can be fixed or sliding.
- **Maximeter reset:** Pushing the button resets the maximeter to zero.

Nominal frequency

☒ 50 Hz

☐ 60 Hz

Device nominal operating frequency configuration.

Distortion calculation

☒ RMS

☐ Fundamental

Use this selector to configure the type of distortion the device will calculate.

Temperature

☒ °C

☐ °F

Device measured temperature value units configuration.

Tariffs

Synchronism type: ☐ Internal clock, ☒ Digital inputs

Number of tariffs: 1

Alarm date form change tariff: 11/07/2008 12:05:27

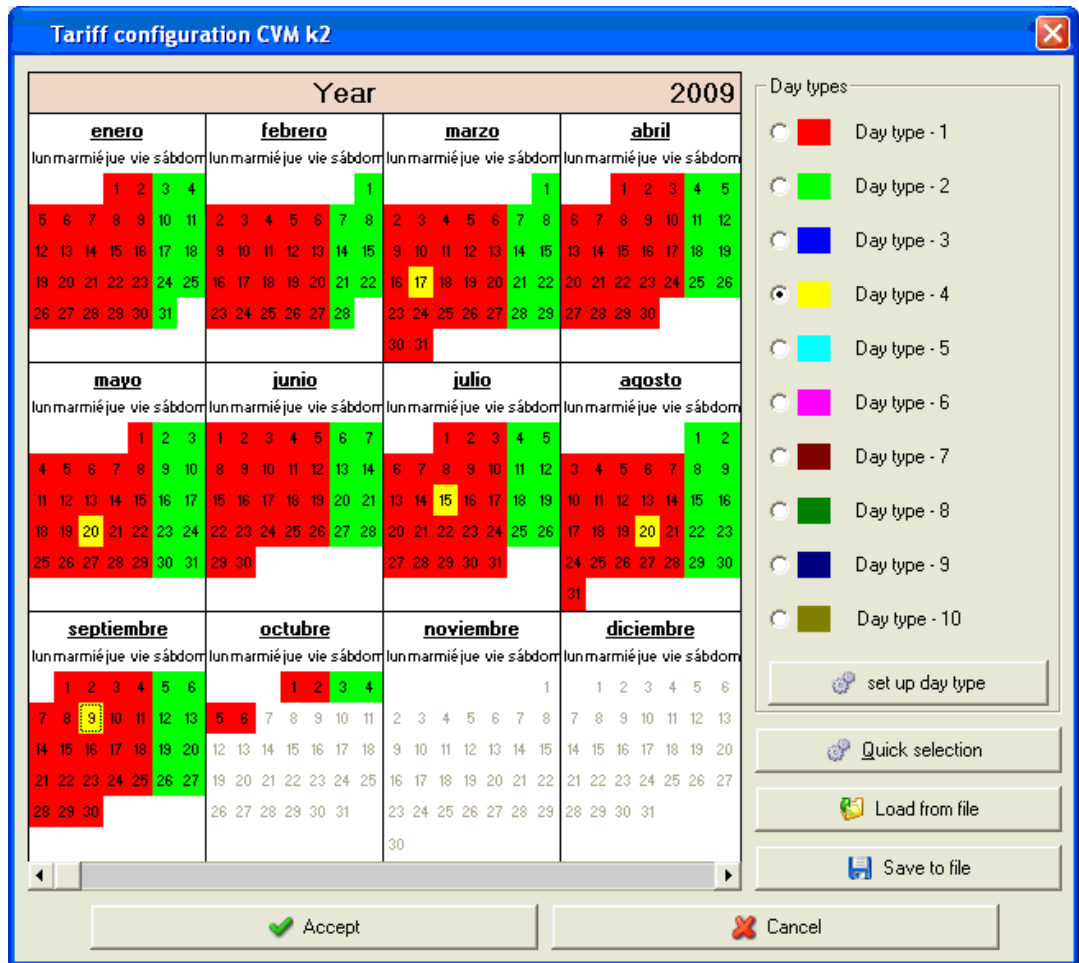
First synchronism input: Expansion card 1 - Digital input 1

Calendar

Device tariff configuration.

- **Synchronisation type:** Tells device to whether to synchronise tariffs by its *internal clock*, by the configured calendar, or by *digital Input* from an external device. The digital input type is only allowed when the device has digital input expansion cards.

- **First synchronisation input:** Only if the synchronisation type is by digital inputs. Select the digital input that corresponds to tariff 1.
- **Number of tariffs:** The quantity of tariffs that the device will use must be indicated.
- **Tariff change alarm date:** Only if synchronisation is by internal clock. Indicate a date that the alarm will sound when a tariff change is due.
- **Calendar** Only if synchronisation is by internal clock. Allows configuration of the tariff calendar by which the device will be governed.

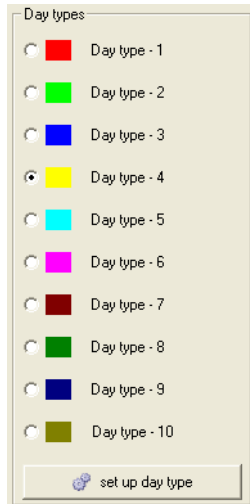


Here the configured device tariff calendar is shown. Each calendar day is colour coded by day type.

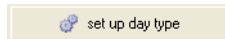
The device can only be configured for 365 days a year from the current date. For this reason the image begins on June 3, 2008 and ends on June 2, 2009. For example, if October 1st is configured as type 1 (red), as long as no calendar configuration changes are made, October 1st of every year will be type 1.

Day selection is done as follows:

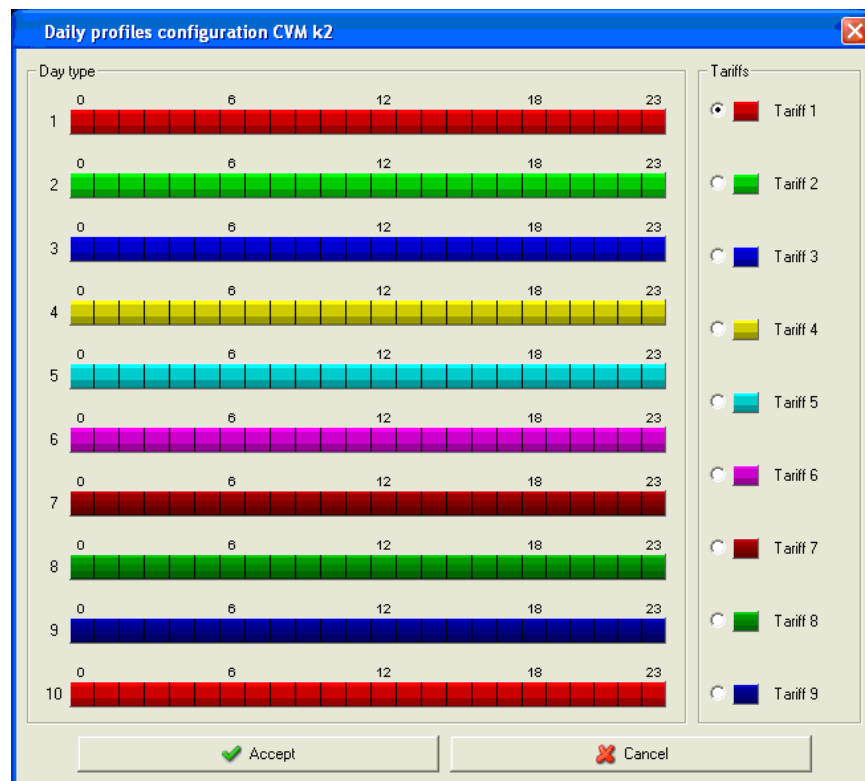
- Left click a day to select it.
- Left click a start date, hold down the SHIFT key, then left click an end date to choose every date in between.
- Use the quick selection option.



Tariff day type. Allows a day of the week to be assigned to the different tariff calendar days. Left click a schedule day to assign the corresponding day of the week.



Allows day of the week to be indicated. Click the button and the following dialogue box appears.



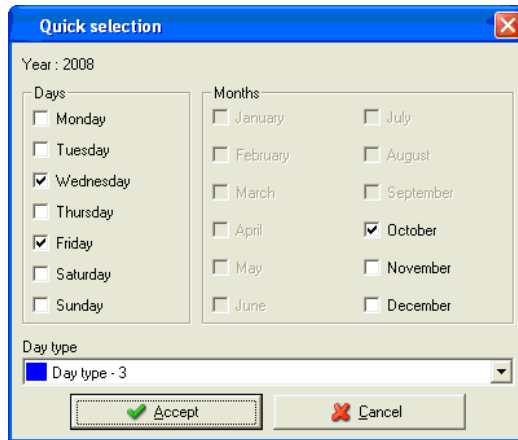
The section on the left displays the different day types divided into one hour strips; on the right you can select the tariff you would like to apply to the day type.

To assign a tariff to a day of the week, first select the desired tariff, then proceed as follows:

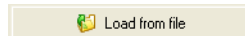
- Clicking the left mouse button on one of the type of day sections, marking only the section selected.
- Left click a start section, hold down the SHIFT key, then left click an end section to select all sections in-between. The initial and final sections must both correspond to the same type of day.



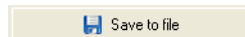
with this option, selections may be made automatically. The following dialogue box will appear.



In this case every Wednesday and Friday of October are marked as day type 3.



Allows the calendar configuration and types of day to be loaded from a file previously saved on a disk. This option is useful when it is necessary to configure the same timetable on multiple devices.



The calendar configuration and the types of day can be stored on a disk, and can be loaded on another device.

1.28.1.3 Expansion Cards

Configuration options may or may not appear according to the number and type of expansion cards in the device.

1.28.1.3.1 Digital input / output



Depending on the card model, the number of inputs and outputs may vary.

	Type	Name	Unit	Factor
1	Digital	IN 1	kW·h	0
2	Digital	IN 2	kW·h	0
3	Digital	ON/OFF		0
4	Meter	4		1
5	Digital			0
6	Digital			0
7	Digital			0
8	Digital			0

Use Digital inputs Digital outputs to switch between card input and output configuration. The previous image shows configuration of the digital inputs.

Each of the digital inputs may be configured as a digital input and therefore the status of the input can be monitored (open or closed) or used as a meter, counting the number of pulses that occur in the digital input.

Configuring the input as digital:

	Type	Name	Unit	Factor
1	Digital	I1		1

- **Type:** The type should be selected as digital.
- **Name:** Alphanumeric data type for the identification of the digital input on the device display.

Otherwise it will be configured as a meter

	Type	Name	Unit	Factor
3	Meter	Meter3		1

- **Type:** The type must be set to meter.
- **Name:** Alphanumeric type data to identify the meter on the device display.

- **Unit:** Alphanumeric type data to indicate that this meter is active.
- **Factor:** Multiplier value for each pulse detected at the input.

Configure digital outputs as follows:

CVMk2 configuration - Expansion card: Digitals 8 Inputs / 8 Outputs

Digital inputs | Digital outputs

Output equations

1	00*00*00*00*00*00*	
2	00*00*00*00*00*00*	
3	00*00*00*00*00*00*	
4	00*00*00*00*00*00*	
5	00*00*00*00*00*00*	
6	00*00*00*00*00*00*	
7	00*00*00*00*00*00*	
8	00*00*00*00*00*00*	

Alarms Triggers

Accept Cancel

Here an output equation is defined for each outputs. This output equation corresponds to a conditional expression to decide when the device should act on the digital output depending on the alarms configured.



Configuration of alarms for use in the output equation. Click the button and the following dialogue box appears.

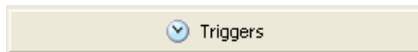
Alarm configuration

	Variable	Maximum	Minimum	Delay	Delay off	Logic state
1	Voltage L1 (V)	300	100	1	5	OFF
2	Temperature (°C o °F)	0	0	1	5	OFF
3	<Deactivate>	0	0	0	0	OFF
4	<Deactivate>	0	0	0	0	OFF
5	<Deactivate>	0	0	0	0	OFF
6	<Deactivate>	0	0	0	0	OFF
7	<Deactivate>	16,711,680	0	0	0	OFF
8	<Deactivate>	255	0	0	0	OFF
9	<Deactivate>	0	0	0	0	OFF
10	<Deactivate>	0	0	0	0	0
11	<Deactivate>	0	0	0	65,280	OFF
12	<Deactivate>	0	0	65,280	0	OFF
13	<Deactivate>	0	-16,777,216	0	0	OFF
14	<Deactivate>	0	65,280	0	0	OFF
15	<Deactivate>	-16,777,216	0	0	0	OFF
16	<Deactivate>	0	0	0	0	OFF

Accept Cancel

Here the 16 device alarms can be configured:

- **Variable:** In this field, select the parameter associated with the alarm; any of the parameters measured by the device can be selected. The maximum and minimum alarm unit values are indicated in brackets.
- **Max:** The maximum value to control is configured. The range allowed depends on the selected variable.
- **Min:** The minimum value to control is configured. The range allowed depends on the selected variable.
- **Delay:** Alarm delay in seconds after activation.
- **Delay off:** Alarm delay in seconds after deactivation.



Configuration of triggers by date and time for use in the output. Click the button and the following dialogue box appears.

 A dialog box titled 'Triggers setup' with a blue header and a red close button. It contains a table with 8 rows and 6 columns: Status, Interval, Date ON, Time ON, Date OFF, and Time OFF. Each cell has a dropdown menu. At the bottom are 'Accept' and 'Cancel' buttons.

	Status	Interval	Date ON	Time ON	Date OFF	Time OFF
1	ON	Unique	10/01/2010	11:05:30	28/10/2062	23:15:15
2	ON	Daily	09/06/2011	1:23:46	09/06/2011	10:32:54
3	ON	Unique	21/03/2011	10:00:00	22/03/2011	22:00:00
4	ON	Daily	09/06/2011	0:00:00	09/06/2011	10:00:00
5	ON	Unique	22/03/2011	8:00:00	22/03/2011	17:30:00
6	OFF	Unique	21/03/2011	0:00:00	21/03/2011	0:00:00
7	OFF	Unique	21/03/2011	0:00:00	21/03/2011	0:00:00
8	OFF	Unique	21/03/2011	0:00:00	21/03/2011	0:00:00

If the trigger condition is fulfilled, the digital output is enabled, otherwise it is disabled.

The trigger may be unique (fulfilled on one occasion) or daily (fulfilled every day). There will be as many triggers as digital outputs.



Allows output equations to be configured. Click the button and the following dialogue box appears.

Equations configuration

Configuration of the digital output equation 1

Alarm 1
AND (*)
Alarm 2
AND (*)
Alarm 3
AND (*)
Alarm 4
AND (*)
Alarm 5
AND (*)
Alarm 6
AND (*)
Alarm 7
AND (*)
Alarm 8
AND (*)

Output equation
01*02*03*04*05*06*07*08*

Accept Cancel

Where the alarm and the operation to be carried out can be selected alternately (AND or OR). To obtain more information on the operation of the digital output equations consult the device manual.

1.28.1.3.2 Analogue inputs and outputs



Depending on the card model, the number of inputs and outputs may vary.

CVMk2 configuration - Expansion card: Analog 8 Inputs / 4 Outputs

Analog inputs | Analog outputs

	Type	Name	Unit	Zero	Fullscale	Decimals
1	0/20 mA	a1	u1	-9.999	9.999	2
2	0/20 mA			0	0	0
3	0/20 mA	input3	un	0	0	0
4	0/20 mA			0	0	0
5	0/20 mA			0	0	0
6	0/20 mA			0	0	0
7	0/20 mA			0	0	0
8	0/20 mA			0	0	0

Accept Cancel

Use **Digital inputs** | **Digital outputs** to switch between input and output configuration. The previous image shows configuration of the analogue inputs.

For each of the analogue inputs the following can be configured:

- **Type:** Enables selection of the different input signal types accepted by the device.
- **Name:** A brief description of the analogue input for its identification on the device screen.
- **Unit:** A brief description of the analogue input measurement units for display on the device screen.
- **Zero:** Value of the parameter to which the zero of the scale is assigned.
- **Fullscale:** Value of the parameter to which the maximum value of the scale is assigned.
- **Decimals:** Number of decimals of the value measured by the analogue input.

Analogue output configuration is shown in the following image:

	Variable	Type	Zero	Fullscale
1	Voltage L1 (V)	0/20 mA	-9,999	9,999
2	Reactive power L2 (kVar)	4/20 mA	102,1	160,2
3	Reactive power consumed L1 (k)	0/20 mA	0	44
4	Reactive power generated L3 (k)	4/20 mA	33	333

Buttons: Accept, Cancel

For each of the analogue inputs the following can be configured:

- **Variable:** Permits any parameter the device measures for analogue outputs to be selected
- **Type:** Allows selection of the different output types the device can generate.
- **Zero:** Value of the parameter to which the zero of the scale is assigned.
- **Fullscale:** Value of the parameter to which the maximum value of the scale is assigned.

1.28.1.3.3 4 digital outputs / 4 analogue outputs

CVMk2 configuration - Expansion card: 4 Digital outputs / 4 Analog outputs

Digital outputs | Analog outputs

Output equations

1	01+02+03+04+05+06+07+09+	[Lightning Bolt]
2	09+10*11+12+13+14+15+16+	[Lightning Bolt]
3	01*02*03*04*05*06*07*08*	[Lightning Bolt]
4	09*10*11*12*13*14*15*16*	[Lightning Bolt]

[Alarms]

[Accept] [Cancel]

Use Digital outputs Analog outputs to switch between configuring analogue and digital card outputs. In the previous image the configuration of the digital outputs can be seen.

For more information on configuring the digital outputs consult the section **¡Error! No se encuentra el origen de la referencia. ¡Error! No se encuentra el origen de la referencia.**

Analogue output configuration is shown in the following image:

CVMk2 configuration - Expansion card: 4 Digital outputs / 4 Analog outputs

Digital outputs | Analog outputs


	Variable	Value -5 mA	Value +5 mA
1	Reactive power III (kVar)	-9,000	9,000
2	Reactive power consumed III (kVar)	5	8
3	Reactive power generated III (kVar)	-2	-1
4	Voltage L1 (V)	1	2

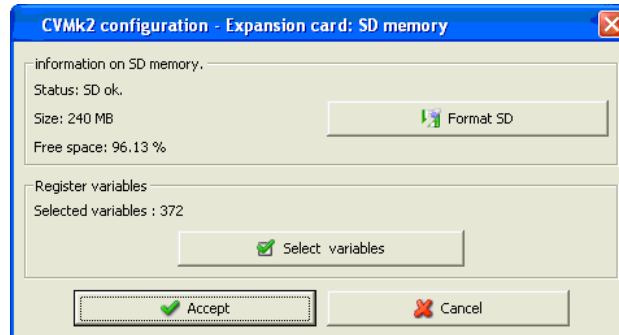
[Accept] [Cancel]

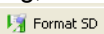
For each of the analogue inputs the following can be configured:

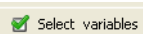
- **Variable:** Permits any parameter the device measures for analogue outputs to be selected
- **Value -5 mA:** Value of the parameter which is assigned to the -5 mA output.
- **Value +5 mA:** Value of the parameter which is assigned to the + 5 mA output.

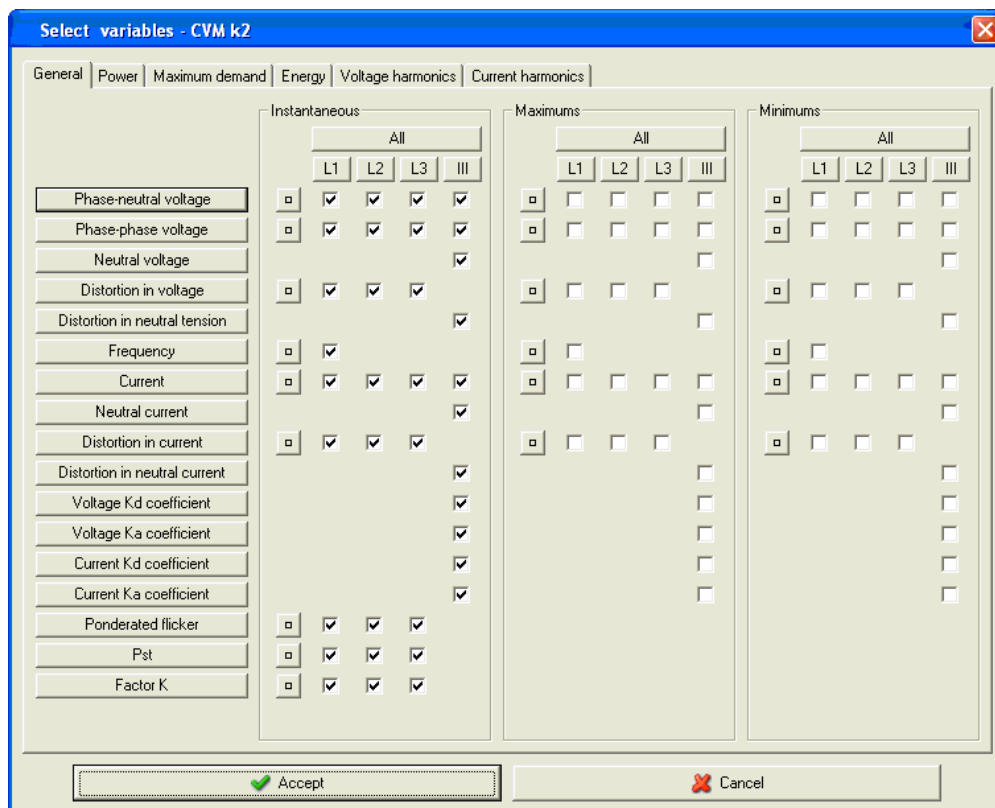
1.28.1.3.4 SD Memory

 If the device has an SD Memory expansion memory, but the SD memory is not inserted, the data measured is not stored in memory or by the software.



On the upper part of the dialogue box, information is shown about the SD Memory inserted into the device. It shows information such as the status, with which it is possible to know if the card works correctly, or if there are any problems, for example, if it is protected from overwriting, the size of the card and the remaining free space. It is also possible by clicking the button  to format the SD card. Remember that formatting the card will erase all data not downloaded by means of the software.

The number of variables that the device saves in the log is shown on the lower part. Click the button  to select the variables that the device will save.

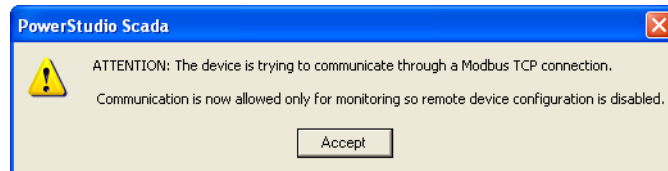


1.29 CVM-K HAR

1.29.1 Connection with modbus TCP

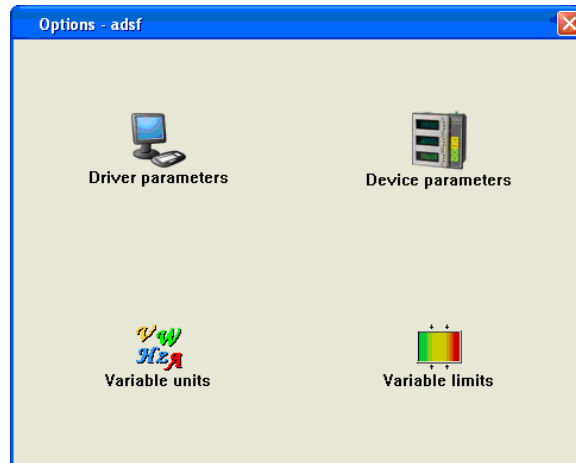
The CVM-K HAR devices can connect on MODBUSTCP connections with some limitations. PowerStudio can read the values measured by the device but cannot read the configuration.

By adding a device on a MODBUSTCP connection, see section 1.18 TCP2RS ModbusTCP converter, PowerStudio displays the following warning:



1.29.2 Driver options

Options menu:



The '*Variable units*' and '*Variable limits*' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.29.2.1 Device parameters



It is not possible to configure the device when it communicates via the MODBUSTCP connection.

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on 'Accept' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

Displays general information.

- **Voltage transformation ratio:** Primary and secondary voltage programming. The primary voltage value should be between 1 and 999999 V and the secondary between 1 and 999 V. The product of the primary value and the primary current must be the same as or less than 20,000,000.
- **Current transformer primary:** This is the device primary current value. Value may be between 1 and 10000 A. The secondary current is 5A in the CVM-K HAR.

Use this selector to configure the type of distortion the device will calculate.

PowerStudio

Alarms		
	Maximum	Delay
Voltage alarm	<input type="text" value="0"/>	<input type="text"/>
Current alarm	<input type="text" value="0"/>	<input type="text"/>

Should an additional module with two relay outputs be available, it can be configured as an alarm mode with the THD or D variables on voltage and on current.

Maximum
<input type="text" value="0"/>

Maximum value. When the value read by the CVM-K HAR device exceeds the programd value, the device will close the contact corresponding to the programd alarm. This maximum programd value will be a % of THD or D.

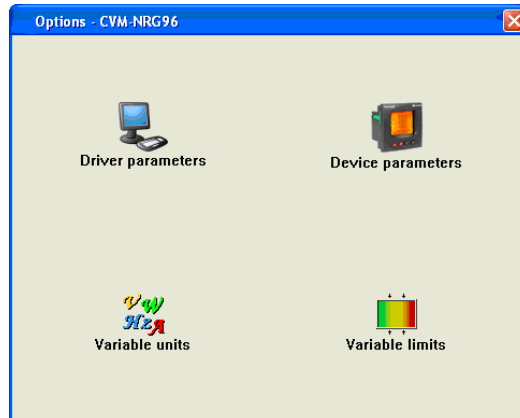
Delay
<input type="text"/>

Delay, both on the connection and disconnection of the alarm relay. This value will be expressed in seconds

1.30 CVM-MINI , CVM NRG-96 and CVM-NET

1.30.1 Driver options

Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.30.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on 'Accept' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

CVM-NRG96 configuration

Device Information

Peripheral number	Model
13	CVM-NRG96
Identifier	Version
CVM-NRG96	1.03
Description	

Transformation ratio

	Primary	Secondary
Voltage	1	1
Current	5	5

Voltage

☒ Single (phase-neutral)
☐ Compound (between phases)

Distortion calculation

☐ THD (Effective value)
☒ D (fundamental)

Alarm

Variable	Maximum	Minimum	Delay
1 Voltage L1 [V]	0	0	0

Password

☐ Enable password
 Password:
 Repeat password:

Maximeter

Period: 15 Window type: Fixed
 Unit: Active power III

Backlight time

10 Seconds

Energy counters

PowerStudio

Device Information	
Peripheral number	Model
13	CVM-NRG96
Identifier	Version
CVM-NRG96	1.03
Description	

Shows general information.

Password

☐ Enable password

Password

Repeat password

Enables the password to be enabled or deactivated to block the configuration of the device by means of the keyboard.

	Primary		Secondary
Voltage	1	/	1
Current	5	/	5

Depending on the version connected, programming of the voltage transformation ratio can be disabled.

- **Voltage transformation ratio:** Primary and secondary voltage programming. The product of the primary value and the primary current must be the same as or less than 20,000,000. The value of the primary, depending on the fullscale of the equipment, must be between 1 and the corresponding value from the following table:

Full-scale	Maximum value.
110V	99.999
250V	70.000
275V	70.000
300V	70.000
500V	40.000

- **Current transformation ratio:** This is the device primary current value. Value may be between 1 and 10,000 A. The secondary current is 5A in the CVM-96.

Maximeter

Period: 15

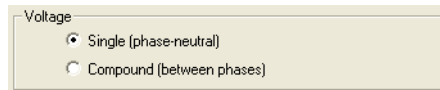
Window type: Fixed

Unit: Active power III

Maximeter reset

- **Period:** This is the maximeter integration period and can vary between 1 and 60 minutes.
- **Window type:** Type of window used to save the maximeter value, this can be fixed or sliding.
- **Unit:** The maximum demand can be calculated with active power III, apparent power III, current III or current by phase depending on the device.
- **Maximeter reset:** When the button is pressed, the device maximeter resets to zero.

PowerStudio

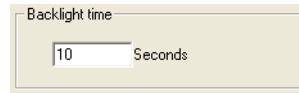


Voltage

☒ Single (phase-neutral)

☐ Compound (between phases)

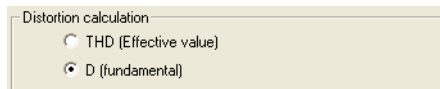
Selecting the type of voltage calculated.



Backlight time

10 Seconds

Configuration of the "*backlight*" disconnection. The value should be between 0 and 99 seconds.



Distortion calculation

☐ THD (Effective value)

☒ D (fundamental)

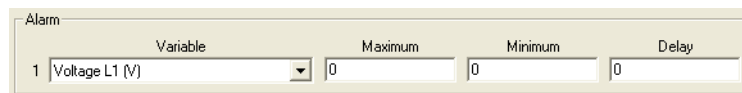
Use this selector to configure the type of distortion the device will calculate.



Energy counters

 Reset

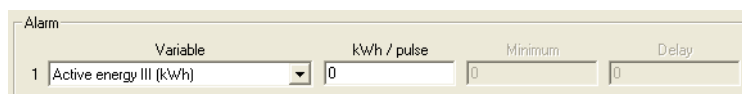
On clicking the button the energy counters on the device will reset to zero.



	Variable	Maximum	Minimum	Delay
1	Voltage L1 (V)	0	0	0

This section shows the configuration of the device relay output and the option to configure it with the desired values is given. For CVM-MINI devices the two relay outputs of these devices can be configured.

- **Variable:** The parameters associated with the relay are indicated in this field. The output is programmed as an alarm or energy pulse with any of the parameters measured by the device being able to be controlled. The maximum and minimum alarm unit values are indicated in brackets.
- **Max:** This box indicates the maximum value to be controlled. If an energy variable is selected, the value of each pulse will be indicated. This will be displayed as follows:



	Variable	kWh / pulse	Minimum	Delay
1	Active energy III (kWh)	0	0	0

- **Min:** This box indicates the minimum value to be controlled. If you select an energy variable, this field will remain disabled.
- **Delay:** Alarm delay in seconds. The maximum value is 9999 seconds. This field will remain deactivated if an energy variable is chosen.

1.31 CVM-NET4

1.31.1 Opciones del driver

Las opciones del dispositivo son las siguientes:



Driver parameters



Device parameters



Variable units



Variable limits

Las opciones '*Unidades de las variables*' y '*Límites de las variables*' se han detallado en los apartados 0 Unidades de las variables y 1.1.2 Límites de las variables respectivamente.

1.31.1.1 Parámetros del dispositivo

Esta pantalla permitirá configurar los parámetros internos del dispositivo. Al abrir el diálogo el software leerá la configuración del dispositivo, al finalizar, si se pulsa '*Aceptar*' y se han producido cambios el software enviará la información al dispositivo. En ningún caso se guardará esta información en el disco duro del PC.

CVM-Net4 configuration

Device Information

Peripheral number 4	Model CVM-NET4
Identifier CVM net4	Version 1.00
Description	

Channel 1 | Channel 2 | Channel 3 | Channel 4

Transformation ratio

	Primary	Secondary
Voltage	1	101
Current	1	Exterior ITF

Maximeter

Period
11

Window type
Fixed

Maximeter reset

Distortion calculation

☒ RMS
☐ D (fundamental)

Energy counters

Reset

Alarm

	Variable	KvAh / pulse	Minimum	Delay
1	Channel 1: Three phase apparent energy III - (Kv)	100	0	0
2	Channel 1: Active energy III - (kWh)	300	0	0
3	Channel 1: Inductive reactive energy III - (kVarh)	50	0	0
4	Channel 2: Reactive power L1 (kVar)	500	-100	0

Accept Cancel

Device Information	
Peripheral number	Model
4	CVM-NET4
Identifier	Version
CVM net4	1.00
Description	


Muestra información general.

Transformation ratio		
	Primary	Secondary
Voltage	1	/ 101
Current	1	/ Exterior ITF

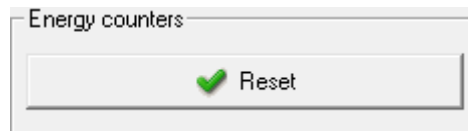
- **Relación de transformación de tensión:** Muestra la relación entre el primario y el secundario de tensión programada en el dispositivo.
- **Relación de transformación de corriente:** Muestra la relación entre el primario y el secundario de corriente programada en el dispositivo.

Distortion calculation	
<input checked="" type="radio"/>	RMS
<input type="radio"/>	D (fundamental)

Mediante este selector se puede configurar el tipo de distorsión que calculará el dispositivo.

Maximeter	
Period	11
Window type	Fixed
<div style="text-align: center;">  Maximeter reset </div>	

- **Período:** Es el período de integración del máxímetro que puede oscilar entre 1 y 60 minutos
- **Tipo de ventana:** Tipo de ventana utilizado para guardar el valor del máxímetro, pudiendo ser fija o deslizante.
- **Reset de máxímetro:** Cuando se pulsa el botón, el máxímetro del dispositivo se pondrá a cero.



Al pulsar el botón se pondrá a cero el contador de energía.

Alarm				
	Variable	Maximum	Minimum	Delay
1	Voltage L1 (V)	100	0	0

En este apartado se muestra la configuración de la salida de relé del dispositivo y se da la opción de configurarla con los valores deseados. Para los dispositivos CVM-NET4 se podrá configurar las cuatro salidas de relé de estos dispositivos.

- **Variable:** En este campo se indica el parámetro que asocia al relé. La salida se programa como una alarma o como pulso de energía, pudiéndose controlar cualquiera de los parámetros medidos por el dispositivo. Entre paréntesis se indican las unidades en las que se expresan los valores máximo y mínimo de la alarma.
- **Máx:** En esta casilla se indica el valor máximo a controlar. En el caso que se seleccione una variable de energía, indicará el valor de cada pulso. Se mostrará de la siguiente manera

Alarm				
	Variable	Kvah / pulse	Minimum	Delay
1	Channel 1: Three phase apparent energy III - (Kv)	100	0	0

- **Mín:** En esta casilla se indica el valor mínimo a controlar. Si se selecciona una variable de energía, este campo permanecerá desactivado.
- **Delay:** Retraso en segundos de la alarma. El valor máximo es 9999 segundos. Este campo permanecerá desactivado si se selecciona una variable de energía.

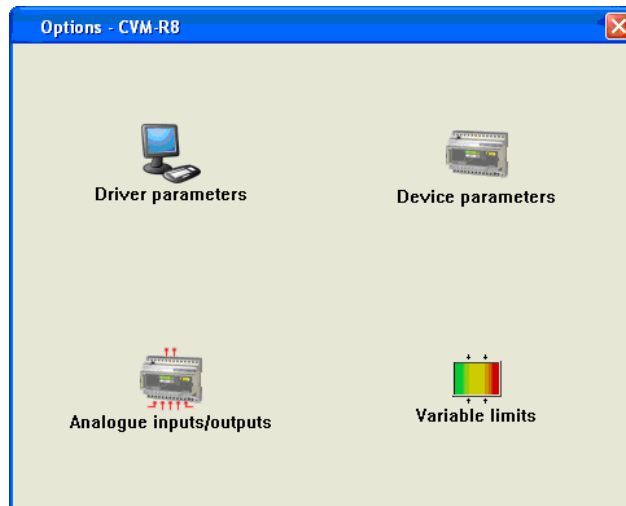
1.32 CVM-R8



Communication will not be possible with the CVM-R8 through a MODBUSTCP connection.

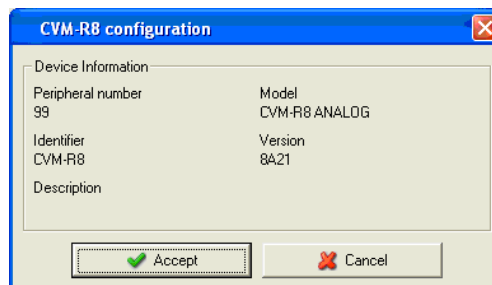
1.32.1 Driver options

The following is the options menu:



1.32.1.1 Device parameters

In the case of CVM-R8 it will not be possible to configure any parameters of the device; it will only be possible to show information about it.



1.32.1.2 Analogue inputs and outputs

From this dialogue the analogue inputs on the CVM-R8 devices with analogue inputs and/or outputs can be configured.

Configure inputs/outputs					
Analog inputs					
	Description	Unit	Zero	Fullscale	Type
1			0	100	0-20 mA
2			0	100	0-20 mA
3			0	100	0-20 mA
4			0	100	0-20 mA
5			0	100	0-20 mA
6			0	100	0-20 mA
7			0	100	0-20 mA
8			0	100	0-20 mA
Analog outputs					
	Description	Unit	Zero	Fullscale	Type
1			0	100	0-20 mA
2			0	100	0-20 mA

Accept Cancel

- **Description:** Alphanumeric type information which enables a brief description to be entered for better identification.
- **Unit:** Alphanumeric type data which permits a brief description of the units to be entered.
- **Zero:** Value of the parameter to which the zero of the scale is assigned.
- **Fullscale:** Value of the parameter to which the maximum value of the scale is assigned.
- **Type:** Type of entry, allows between 0-20 mA, 4-20 mA or 0 -? to be chosen V

1.32.1.3 Variable limits

Only for CVM-R8 devices with analogue inputs.

This option has been detailed in section 1.1.3 Variable limits.

1.33 CVM-SP

1.33.1 Driver options

Options menu:



1.33.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on 'Accept' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

Device Information	
Peripheral number	Model
1	CVM-SP
Identifier	Version
CVM-SP	4.00
Description	

Transformation ratio	
	Primary / Secondary
Voltage	1 / 1
Current	5 / 1

Distortion calculation	
<input checked="" type="radio"/> THD (Effective value) <input type="radio"/> D (fundamental)	

Password	
<input type="checkbox"/> Enable password	
Password	
Repeat password	

Maximeter	
Period	15
Unit	Active power
Maximeter reset	

Energy counters	
Reset	

Accept Cancel

Device Information	
Peripheral number	Model
1	CVM-SP
Identifier	Version
CVM-SP	4.00
Description	

Shows general information.

☐ Enable password
 Password
 Repeat password

Enables the password to be enabled or deactivated to block the configuration of the device by means of the keyboard.

	Primary	Secondary
Voltage	1	1
Current	5	1

- Voltage transformation ratio:** Primary and secondary voltage programming. The product of the primary value and the primary current must be the same as or less than 20,000,000. The primary value, depending on fullscale, must be between 1 and the value of the following table:

Full-scale	Maximum value.
110v	99.999
275v	70.000
300v	70.000
500v	40.000

- Current transformation ratio:** This is the device primary current value. Value may be between 1 and 10,000 A. The secondary current is 5A in the CVM-144.

Period
 15
 Unit
 Active power
 Maximeter reset

- Period:** This is the maximeter integration period and can vary between 1 and 60 minutes.
- Unit:** The maximum demand can be calculated with active power III, apparent power III, current III or current by phase depending on the device.
- Maximeter reset:** When the button is pressed, the device maximeter resets to zero.

Distortion calculation
☒ THD (Effective value)
☐ D (fundamental)

Use this selector to configure the type of distortion the device will calculate.

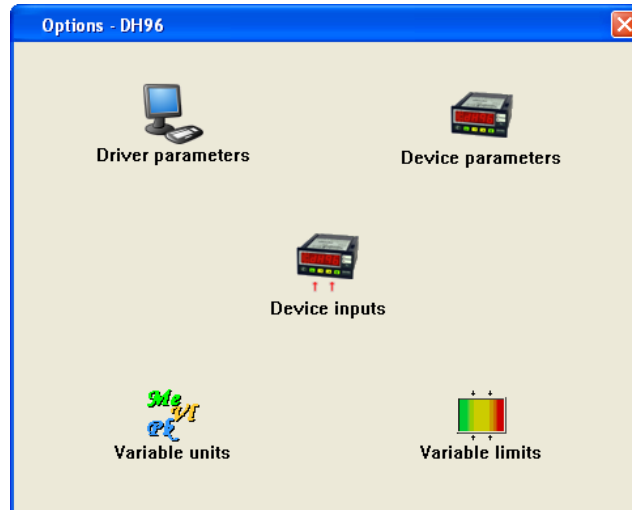
Energy counters
 Reset

On clicking the button the energy counters on the device will reset to zero.

1.34 DH-96

1.34.1 Driver options

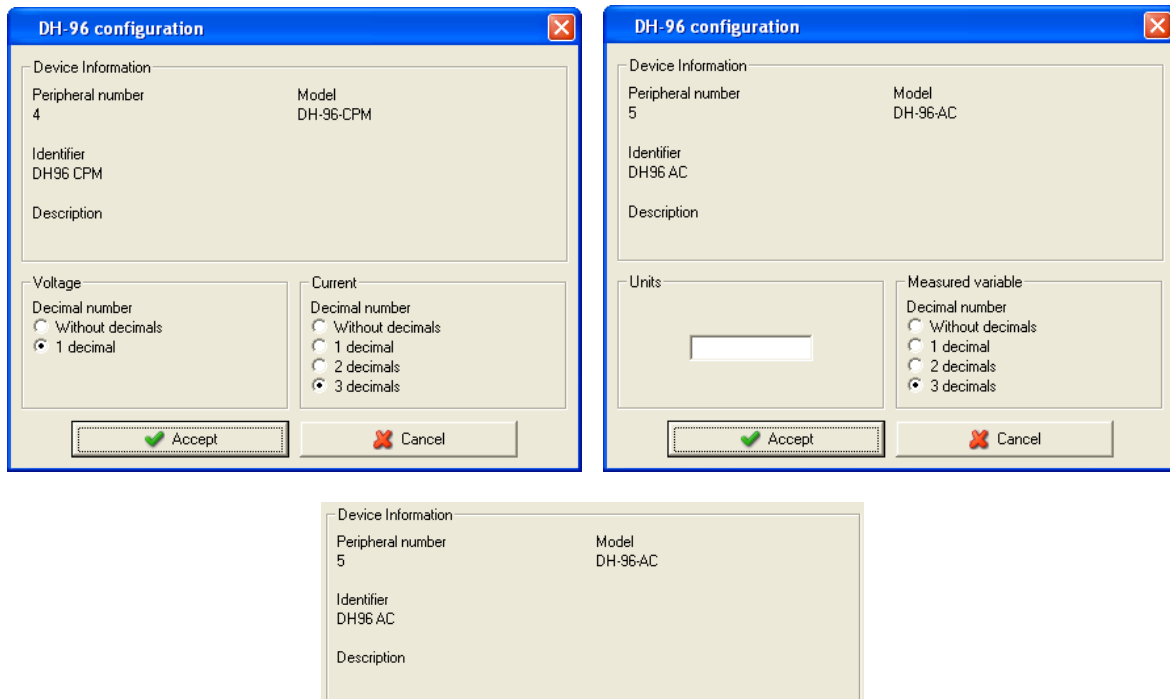
Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively. The 'Device inputs' option only appears on DH-96 CT and DH-96 CPP devices.

1.34.1.1 Device parameters

On DH-96 devices it will not be possible to modify internal parameters; they must be changed manually using the device keyboard. For more information on how to modify the parameters see the manual that comes with the device.



Shows general information.

Alphanumeric type data which permits a brief description of the DH-96 units of measurement to be entered. These units will be displayed in the data display, in no event will they be sent to the device. 1.33.2.2 This parameter will not appear on DH-96 CT units, on the DH-96 CT equipment a brief description of the units can be entered on the input screen, 3.25.1.2 InputInputss.

Only for DH-96 AC, DH-96 CT, DH-96 DC, DH-96 WG, DH-96 CPP equipment. The number of decimal places used when displaying the variable measured on the equipment can be configured. This parameter will be used solely as information on your computer, and at no time will it be sent or read by the equipment.

Only for DH-96 CPM equipment. The number of decimal places used displaying the voltage on the equipment can be configured. This parameter will be used solely as information on your computer, and at no time will it be sent or read by the equipment.

Only for DH-96 CPM equipment. The number of decimal places used displaying the current in the equipment can be configured. This parameter will be used solely as information on your computer, and at no time will it be sent or read by the equipment.

For DH-96 CPP devices the parameters screen changes substantially:

DH-96 CPP configuration

Device Information Peripheral number: 2 Model: DH-96 CPP Identifier: DH96CPP Description:		Measured variable Decimal number: <input checked="" type="radio"/> Without decimals <input type="radio"/> 1 decimal <input type="radio"/> 2 decimals <input type="radio"/> 3 decimals
Operation mode <input checked="" type="radio"/> Master <input type="radio"/> Slave	Integration period 15 minutes	Energy by pulse 1 Wh
Integration type Block sinc T	Control type <input checked="" type="radio"/> Predictive <input type="radio"/> Level	Conec/disconec. type <input type="radio"/> C. cyclic <input checked="" type="radio"/> C. lineal
Contracted power 0 Kwh	Connection delay 0 seconds	Transitory time 1 seconds
Number of relays 4		<input type="checkbox"/> Security failure
Relay 1 Relay 2 Relay 3 Relay 4		
Power 0 Kwh	<input checked="" type="checkbox"/> Latch <input checked="" type="checkbox"/> Safety relay failure	Alarm 0 Kwh
Hysteresis 4 %	Connection delay 0 seconds	Disconnection delay 0 seconds
<div> <input checked="" type="button" value="Accept"/> <input type="button" value="Cancel"/> </div>		

Operating mode
☒ Master
☐ Slave

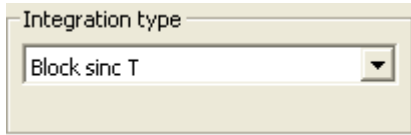
The operating mode of the DH-96 is selected, in Master mode the device controls the relays, in Slave mode control is done via modbus.

Integration period
 15 minutes

The integration period in minutes is entered (from 1 to 60). In thermal integration mode, the desired response time will be 90% of the final value.

Energy by pulse
 1 Wh

The energy value relating to each KYZ pulse received by the equipment is entered.

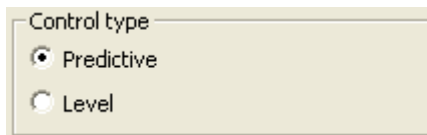


Integration type

Block sinc T

The equipment integration type is selected. The possible values are:

- Block sync P: Synchronized with the company's maximeter, by means of synchronisation pulses that occur at the beginning of each period.
- Block sync T: Synchronized with the company's maximeter, by means of a synchronisation pulse. From this the equipment calculates the beginning and end of each period based on an internal clock. When it receives a new synchronisation pulse it will readjust and again synchronise.
- Rolling: Without synchronisation with the company's maximeter, using a sliding window.
- Thermal: Without synchronisation with the company's maximeter, using a sliding window and simulating the response of the thermal exponential function of the mechanical counters.

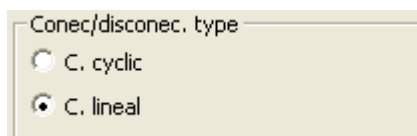


Control type

☒ Predictive

☐ Level

Select the operating mode for controlling the relays, two possibilities: predictive control or control by level. This parameter can only be configured when one of the types of integration with synchronisation is selected, the types of integration without synchronisation control will be by level. The control type will depend on the relay configuration.



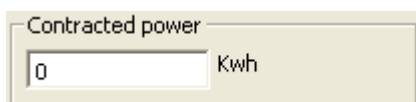
Conec/disconec. type

☐ C. cyclic

☒ C. lineal

Only in predictive control. The connection/disconnection type is selected. The types are:

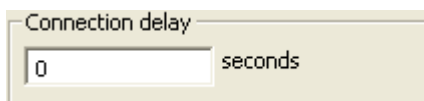
- C. cyclic: Cyclic, the relays that have been operating the longest disconnect first.
- C. lineal: Lineal, where connection or disconnection is done by priorities, relay 1 being the first to disconnect.



Contracted power

0 kwh

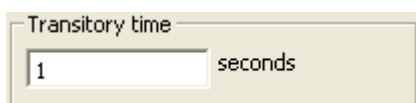
Only in predictive control. Value of the power contracted for the installation.



Connection delay

0 seconds

Only in predictive control. Minimum waiting time before reconnecting a relay.



Transitory time

1 seconds

Only in predictive control. Time to adapt the controller response time to the characteristics of the installation.

Number of relays

4

The number of relays to be used in the installation is selected.

☐ Security failure

Only in predictive control. It will only be possible to choose between the two status modes of the contract.

Power

0 Kwh

Only in predictive control. Value of the power contracted for each of the relays.

Alarm

0 Kwh

Only in control by level. Value of the demand at which the alarm is triggered.

Hysteresis

4 %

Only in control by level. The desired difference between the connection and disconnection point of the relay is entered in %. The value must be between 4 and 50 %.

Connection delay

0 seconds

Only in control by level. Time elapsed from end of alarm situation until relay is connected.

Disconnection delay

0 seconds

Only in control by level. Time elapsed from when the alarm value is exceeded until the relay is disconnected.

☒ Latch

Only in control by level. Specifies whether or not the alarm will remain locked after it has been triggered, even though the condition that caused it disappears.

☒ Safety relay failure

Only in control by level. It will only be possible to choose between the two status modes of the contract for each of the relays.

1.34.1.2 Inputs

Only for DH-96 CT devices

Input configuration

Meter

Description	Unit	Factor
Meter input	pulse	1

Flow

Description	Unit	Factor
Flow input	l/h	1

☒ Enable flow variable

Time (min)	Calculation window (s)
60	30

Accept Cancel

This screen lets the flow and counter variable that can be used on the DH-96 CT equipment be configured.

- **Counter Variable**
 - **Description:** Alphanumeric type data which allows a brief description of the input for better identification.
 - **Unit:** Alphanumeric type data which enables a brief description of the input units to be entered.
 - **Factor:** Multiplier factor to be applied to the value read from the device.
- **Flow variable:** The input will be treated as a flow counter. The value of this variable is calculated from the counter variable value read from the device.
 - **Enable flow variable:** Using this option it is possible to enable or disable use of the device input software as if it were a flow counter. If this is disabled it will not be displayed, nor will it be possible to use this variable on the software.
 - **Description:** Alphanumeric type data which allows a brief description of the input for better identification.
 - **Unit:** Alphanumeric type data which permits a brief description of the units to be entered.
 - **Factor:** multiplier to be applied to the value read from the device.
 - **Time:** Parameter to calculate the flow value.
 - **Calculation window:** Time window, in seconds, that the software will use to calculate an estimate of the flow, taking into account the value of the device counter.

1.35 EDMk

1.35.1 Driver options

Options menu:



The 'Variable units' option is detailed in section 1.1.2 Variable Units.

1.35.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

Shows general information.

Configuration of the transformation ratio of the device.

- **Voltage transformation ratio:** Primary and secondary voltage programming. The product between the primary value and the primary current must be the same as or less than 20.000.000. The primary value must be between 1 and 999.999 V while the secondary can be between 1 and 999 V.
- **Current transformation ratio:** This is the primary and secondary current value the device has. The primary can value between 1 and 9999 A and the secondary between 1 or 5 A.

Device screen display

- **Omit reactive measurement:** The reactive measurements are not shown on the device screen, although they will continue to be displayed on the software display screens.
- **Omit partial counters:** Partial counter measurements are not shown on the screen of the device nor on the display screens of the software.

Configuration of the "*backlight*" disconnection. The value should oscillate between 0 and 10 seconds.

On clicking the button all the partial counters of the device will be started.

Configuration of the number of quadrants. With only 2 quadrants the consumed energy counters will be taken into consideration and with 4 the consumed and generated energy counters.

Configuration of the output relay of the active energy. The number of Wh equivalent to an output impulse and the variable that will be measured to give this pulse. If the pulse value is 0, the output will be treated like a standard digital output, enabling it value to be forced from 0 to 1.

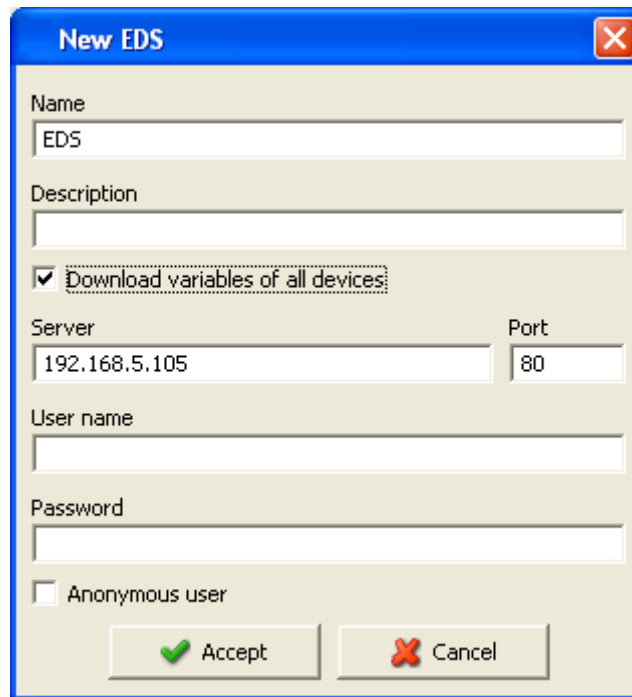
Configuration of the output relay of the active energy. The number of VARh equivalent to an output pulse and the variable that will be a measured to give the pulse can be configured. If the pulse value is 0, the output will be treated like a standard digital output enabling it value to be forced from 0 to 1.

1.36 EDS

The EDS driver has a unique feature in that it can access the variables for the equipment that is connected to it, as well as its own variables for flow, meters, and digital inputs and outputs.

1.36.1 Configuration of EDS device

Use the devices menu to add a new EDS as a first level device.



The 'New EDS' dialog box is shown with the following fields and options:

- Name:** EDS
- Description:** (empty text box)
- ☒ **Download variables of all devices:**
- Server:** 192.168.5.105
- Port:** 80
- User name:** (empty text box)
- Password:** (empty text box)
- ☐ **Anonymous user**
- Buttons:** Accept (with a green checkmark icon) and Cancel (with a red X icon)

As shown in the previous dialogue box, the address and port of the EDS equipment to which we want to connect must be indicated, and also the user and password if authentication is enabled.

The 'Download variables of all devices' option may be chosen, in which case all machines and variables accessible in the remote EDS will automatically be downloaded. If this option is not set, each variable must be added manually.

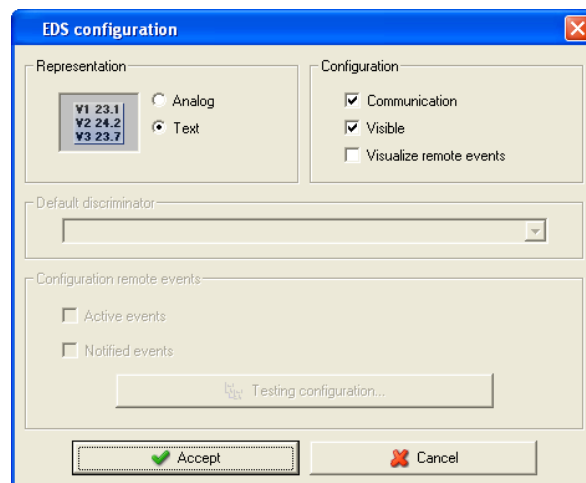
1.36.2 Driver options

Options menu:



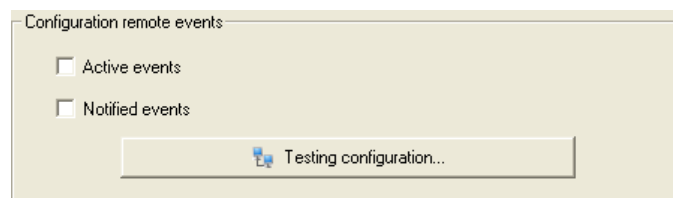
The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.36.2.1 Driver Parameters



☐ Visualize remote events

Allows the display of remote events in the client to be activated.



On activating the display of remote events the configuration of remote events will be enabled; here you can activate the types of events you want to receive and you can test communication with the remote equipment. These events can be displayed on the client in the same way as local events.

The remaining screen parameters are detailed in section 1.1.1 Driver parameters.

1.36.2.2 Device parameters

This screen is used to configure the variables that must be requested from the EDS relating to the machines connected to it. In this case variable 'Frequency' of device 'CVM144' has been selected.

The screenshot shows the 'EDS configuration' window. It has three main sections: 'Device Information', 'Date/time', and 'Variables'.
 - 'Device Information': A table with 'Identifier' (EDS) and 'Description'.
 - 'Date/time': Fields for 'Primary NTP server' and 'Secondary NTP server', with a 'Synchronise clock' button.
 - 'Variables': A table with 'Identifier' and 'Name'. The selected row is 'CVM144.HZI' with name 'CVM144 Frequency'. To the right of this table, detailed information for the selected variable is shown: Identifier: CVM144.HZI, Name: CVM144 Frequency, Description: , Type: Reading, Format: 1 decimal, Units: Hz, Agrupation criteria: Average value, Save: Yes.
 At the bottom are buttons for '+ Add', 'Modify', 'Delete', 'Import configuration', 'Export configuration', 'Accept', and 'Cancel'.

Identifier	Name
CVM144.HZI	CVM144 Frequency

Identifier: CVM144.HZI
 Name: CVM144 Frequency
 Description:
 Type: Reading
 Format: 1 decimal
 Units: Hz
 Agrupation criteria: Average value
 Save: Yes

This close-up shows the 'Device Information' section of the configuration window. It contains a table with two columns: 'Identifier' and 'Description'. The row shows 'EDS' as the identifier.

Identifier	Description
EDS	

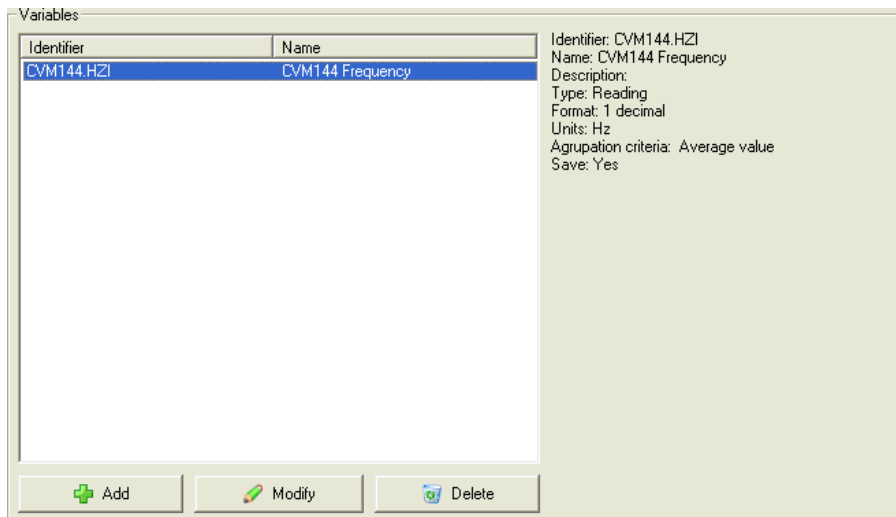
General information on

the EDS device.

This close-up shows the 'Date/time' section of the configuration window. It includes input fields for 'Primary NTP server' and 'Secondary NTP server', and a 'Synchronise clock' button with a clock icon.

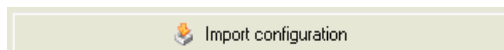
Possibility of sending the

time and date from the PC to the EDS device or configure an NTP server so that the device itself sets its time through the server.

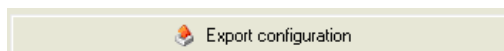


Configuration of the

variables added to the EDS device.



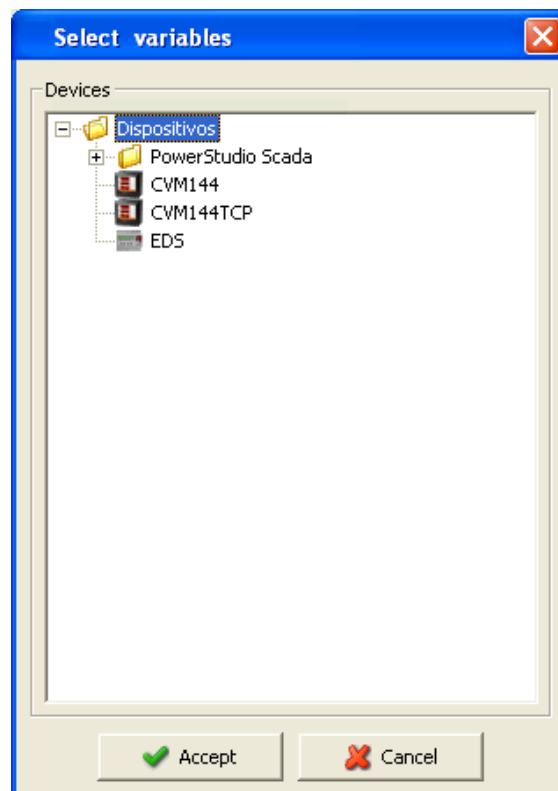
Allows a variable configuration that was previously saved to disk to be loaded. This option is useful when the same variables have to be configured on several EDS devices.



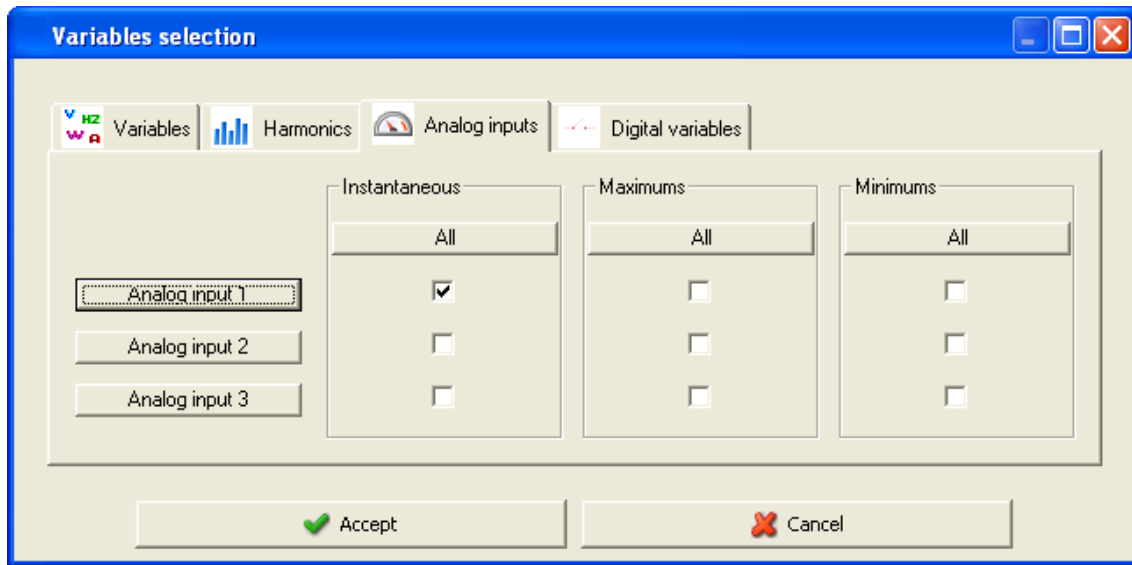
Allows the variable configuration to be saved to disk, so that it can subsequently be loaded on another EPS device.

1.36.2.2.1 Variables

When the 'Add' button is pressed a selection tree for the EDS devices will appear. When a device is selected, its variables selection screen will appear, and the desired variables may be added.



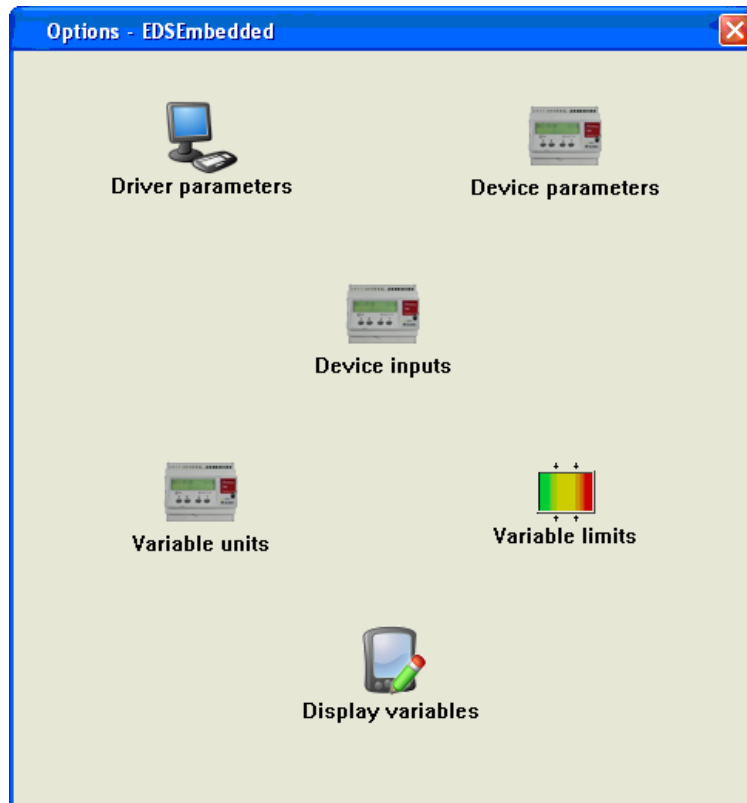
As an example of the variable selection screen we have that of a 'CVM 144' where we can see that the instantaneous 'Analogue input 1' variable has been selected.



1.37 EDS Embedded⁷

1.37.1 Driver options

Options menu:



The '*Variable units*' and '*Variable limits*' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.37.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "*Accept*" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

⁷ Only valid in applications running inside EDS

EDSEmbedded configuration

Device Information

Peripheral number	Model
255	EDSEmbedded
Identifier	Version
EDS Embedded	1.10
Description	

Relay Timer

1	<input type="text" value="50"/>	x 20 ms = 1000 ms	4	<input type="text" value="50"/>	x 20 ms = 1000 ms
2	<input type="text" value="50"/>	x 20 ms = 1000 ms	5	<input type="text" value="50"/>	x 20 ms = 1000 ms
3	<input type="text" value="50"/>	x 20 ms = 1000 ms	6	<input type="text" value="50"/>	x 20 ms = 1000 ms

Meters

1	<input type="text" value="1082"/>	5	<input type="text" value="0"/>
2	<input type="text" value="2"/>	6	<input type="text" value="2"/>
3	<input type="text" value="0"/>	7	<input type="text" value="1"/>
4	<input type="text" value="0"/>	8	<input type="text" value="16"/>

☐ Load values in device meters

Date/time

Device Information

Peripheral number	Model
255	EDSEmbedded
Identifier	Version
EDS Embedded	1.10
Description	

General information on the EDS Embedded device.

Relay Timer

1	<input type="text" value="50"/>	x 20 ms = 1000 ms	4	<input type="text" value="50"/>	x 20 ms = 1000 ms
2	<input type="text" value="50"/>	x 20 ms = 1000 ms	5	<input type="text" value="50"/>	x 20 ms = 1000 ms
3	<input type="text" value="50"/>	x 20 ms = 1000 ms	6	<input type="text" value="50"/>	x 20 ms = 1000 ms

Allows you to configure each relay timer in ms.

Meters

1	1082	5	0
2	2	6	2
3	0	7	1
4	0	8	16

☐ Load values in device meters

device's meters.

It is possible to load a value into the

Date/time

Synchronise clock

time to the EDS Embedded device.

Allows you to send the PC date and

1.37.1.2 Device inputs

Input configuration

Meters | Flow | Digital inputs | Digital outputs

	Description	Unit	Factor
1			1
2			1
3			1
4			1
5			1
6			1
7			1
8			1

Accept Cancel

Use to switch between the flow, digital inputs and outputs configurations of the meters. The previous image shows the configuration of the meters.

it is possible to configure the following information for each of the eight meters:

- **Description:** Alphanumeric type data to identify the meter on the device display.
- **Unit:** Alphanumeric type datum to identify the meter units.
- **Factor:** Multiplier value which can be read on the meter.

The configuration of the flows will look as follows:

	Description	Unit	Factor	Time (min)	Calculation window (s)
<input checked="" type="checkbox"/> 1			1	1	30
<input checked="" type="checkbox"/> 2			1	1	30
<input type="checkbox"/> 3			1	1	30
<input type="checkbox"/> 4			1	1	30
<input type="checkbox"/> 5			1	1	30
<input type="checkbox"/> 6			1	1	30
<input type="checkbox"/> 7			1	1	30
<input type="checkbox"/> 8			1	1	30

Accept Cancel

Checking the selector ☒ will activate the flow variable. Remember if the selector is not checked it will not be possible to view the flow value of the related EDS Embedded input.

- **Description:** Alphanumeric type data which permits a brief description of the flow to be entered for better identification.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the flow is shown to be entered.
- **Factor:** Multiplier value of each input pulse.
- **Time:** Time in minutes for calculating the flow value.
- **Calculation window:** Time window, in seconds, that the software will use to calculate an estimate of the flow, taking into account the value of the device meter.

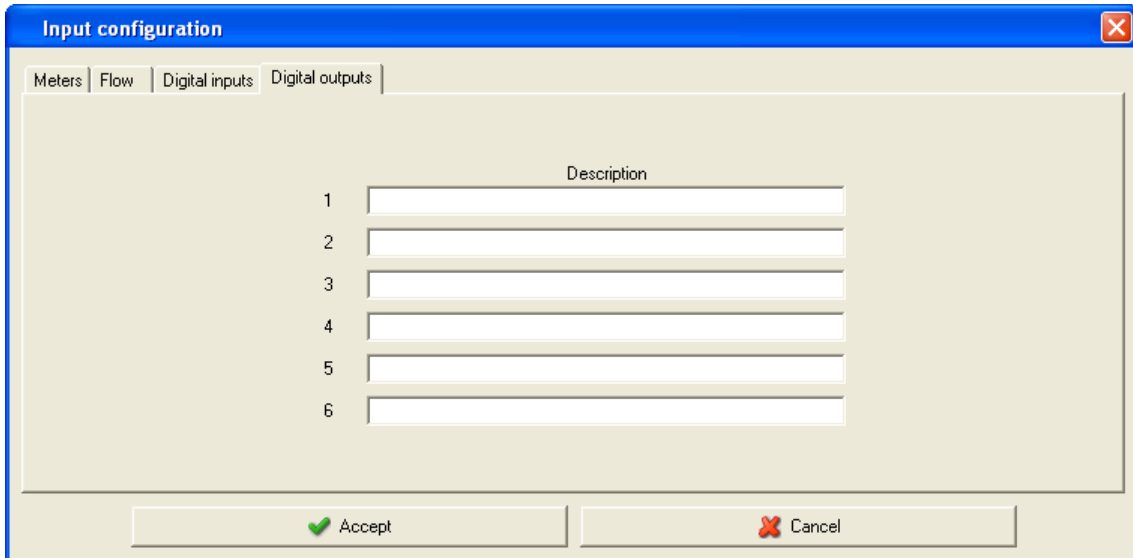
The configuration of the digital inputs is as follows:

	Description
1	
2	
3	
4	
5	
6	
7	
8	

Accept Cancel

- **Description:** Alphanumeric type data which permits a brief description of the digital input to be entered for better identification.

Finally, the configuration of the digital outputs is as follows:

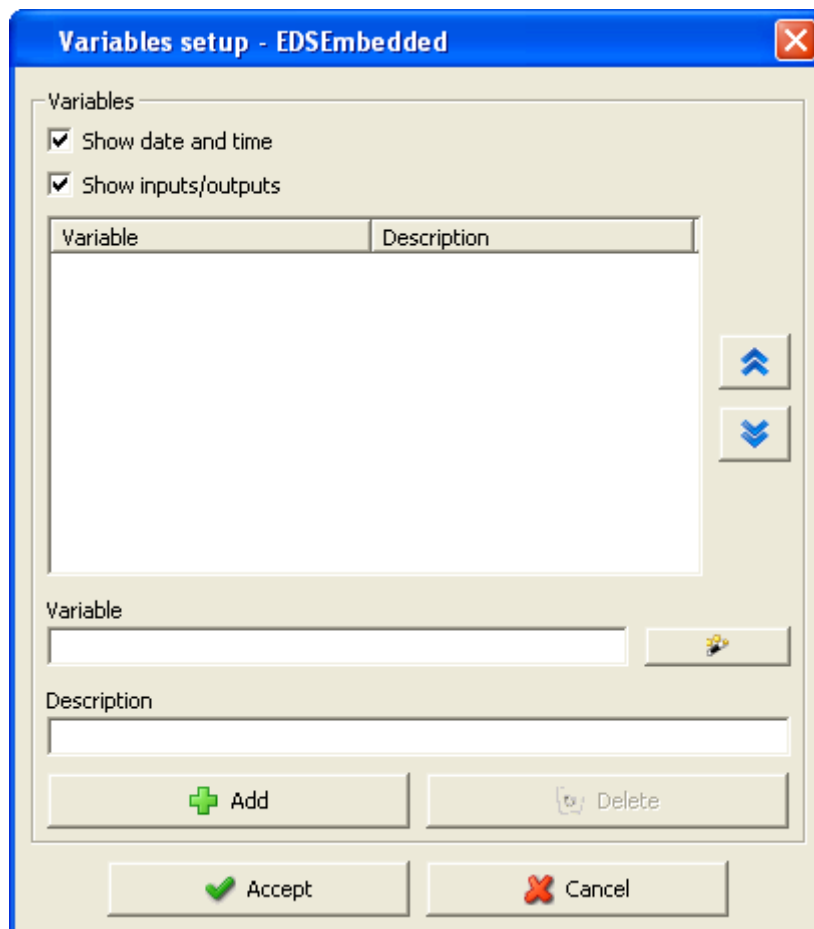


The 'Input configuration' dialog box features a blue title bar with a close button. It contains four tabs: 'Meters', 'Flow', 'Digital inputs', and 'Digital outputs', with 'Digital outputs' currently selected. The main area is a table with a header 'Description' and six numbered rows (1-6), each with an empty text input field. At the bottom, there are 'Accept' and 'Cancel' buttons.

	Description
1	
2	
3	
4	
5	
6	




- **Description:** Alphanumeric type data which permits a brief description of the digital output to be entered for better identification.

1.37.1.3 Display variables





The 'Variables setup - EDSEmbedded' dialog box has a blue title bar with a close button. It includes a 'Variables' section with two checked checkboxes: 'Show date and time' and 'Show inputs/outputs'. Below these is a table with columns 'Variable' and 'Description'. To the right of the table are up and down arrow buttons. At the bottom of the table area are 'Variable' and 'Description' text input fields, with a small icon button to the right of the 'Variable' field. At the very bottom are 'Add' and 'Delete' buttons, followed by 'Accept' and 'Cancel' buttons.

Variable	Description
----------	-------------

This dialogue box allows you to configure the variables you would like to view on the device's display. You can activate the display of the equipment time and date  Show date and time and/or display the input and output variables  Show inputs/outputs and/or any other variable accessible from the equipment by typing manually or via the  button.

You can attach text to display rather than the variable name. If the description text field is empty, the name of the variable will be displayed.

The order of the variables can be changed so that they are shown in a specific order on the equipment's display using the  or  buttons.

1.38 Generic Modbus⁸

Due of the variety of devices that communicate with Modbus protocol currently on the market, a generic device to enable quick and easy communication with these devices has been created.

Once the variables to be read have been configured, the device will behave in a manner similar to other devices with which the program communicates.

1.38.1 Driver options

Options menu:



The '*Variable units*' and '*Variable limits*' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

⁸ Only in Deluxe version

1.38.1.1 Device parameters

This screen is used to configure the variables that should be requested from the device. The variables are in two groups, numeric variables (voltages, currents, counters, etc.) and binary variables (typically digital inputs and outputs).

General device information

Device numerical variables

configuration. See 1.37.1.1.1 Numeric variables.

Device binary variables

configuration. See 1.37.1.1.2 Digital variables.

Allows the configuration of numeric and binary variables of a file previously saved on the disk to be loaded. This option is useful when the same variables have to be configured on several devices

Export configuration Allows the configuration of numerical and binary variables to be saved on a disk and then loaded onto another Generic Modbus TCP device.

Options >> Allows advanced configuration options on the device to be displayed or hidden.

- **Brings together variables in groups:** These parameters permit the maximum size of the frames to be configured in communications for those devices which do not permit communication with frames of a maximum size greater than that of the Standard modbus. To carry out the minimum number of possible requests and thus penalize the communication as little as possible, the program will try to arrange the configured variables into groups of variables. This parameter can indicate the maximum grouping permitted
- **Data in little-endian:** By default the data sent by devices is considered to come in big-endian. If the device returns it in little-endian this option should be enabled.

1.38.1.1.1 Numeric variables

Click the “Add” or “Modify” button and the dialogue will appear to configure the numeric variable.

Where

- **Identifier:** Allows each of the numeric variables to be used in expressions and conditions, to be identified, see 'Editor Manual'.
- **Name:** Name of the numeric variable used to identify it better.
- **Description:** Short description of the variable.

- **Address:** Modbus map address of the device where the variable can be found.
 - **Records:** Number of registers which occupy the variable on the Modbus map.
 - **Others:** Different parameters to configure in the variable.
 - **Save:** Indicates if the device value read should be saved on the value log or not.
 - **Incremental:** Indicates whether the value of the variable displayed is incremental. Typical energy variable option to see increments.
 - **Analogue variable:** Indicates whether the variable to be read is of the analogue type.
 - **Zero:** Value of the parameter to which the zero of the scale is assigned.
 - **Fullscale:** Value of the parameter to which the maximum value of the scale is assigned.
 - **Type:** Type of output, allows between 0-20 mA, 4-20 mA or 0 -? V, depending on the device.
 - **Accuracy:** Number of bits in the sample.
 - **Type:** Selects the type of variable; i.e., read, write or both. If the variable is write or read/write the value can be forced on the device.
 - **Format:** Indicates the format in which the device returns the variable value. The value can be expressed in the IEE754 format, with a symbol, and the number of decimal points may be indicated.
 - **Grouping criteria:** Enables the grouping criteria of the values of the variable to be selected in graphs, tables, or reports, and the value to be saved in the values register. For example, if in the period between saving information we have 3 values (10, 12 and 7) these will be saved in the log.
 - Maximum value: The maximum value of the 3 (12) will be saved
 - Minimum value: The minimum value of the 3 (7) will be saved.
 - Average value: The average value of the 3 $((10 + 12 + 7) / 3 = 9.66)$ will be saved.
 - Last value: The last value will be saved (7).
 - Sum of the values: The last value will be saved (7).
- In the case of clusters of values in graphs, tables and reports, the same criteria will be followed, except when it is the summation of values where the sum of 3 values is shown ($10 + 12 + 7 = 29$).
- **Units:** Units in which the value is expressed. You can select one of the predefined units or define a new user unit.
 - **Use:** Shows where the variable may be used in the rest of the program.



For more information on the digital map of numeric variables and its configuration consult the device manual.

1.38.1.1.2 Digital variables

Push the “Add” or “Modify” button and the dialogue will appear to configure the binary variable.

The dialog box titled "New binary variable" contains the following fields and options:

- Name:** An empty text input field.
- Description:** An empty text input field.
- Identifier:** An empty text input field.
- Address:** A text input field containing the value "0".
- Type:** A group box containing three radio buttons:
 - ☒ Reading
 - ☐ Writing
 - ☐ Reading/Writing
- Use:** A group box containing a grid of checkboxes:

<input type="checkbox"/> Discriminator	<input type="checkbox"/> Screen	<input type="checkbox"/> Graphic/Table
<input type="checkbox"/> Events	<input type="checkbox"/> Reports	<input type="checkbox"/> Force
- Buttons:** "Accept" (with a green checkmark icon) and "Cancel" (with a red X icon).

Where

- **Identifier:** Allows each of the binary variables, which are to be used in expressions and conditions, to be identified, see 'Editor Manual'.
- **Name:** Name of the numeric variable used to identify it better.
- **Description:** Short description of the variable.
- **Address:** Modbus map address of the device where the variable can be found.
- **Type:** Selects the type of variable; i.e., read, write or both. If the variable is write or read/write the value can be forced on the device.
- **Use:** Shows where the variable may be used in the rest of the program.

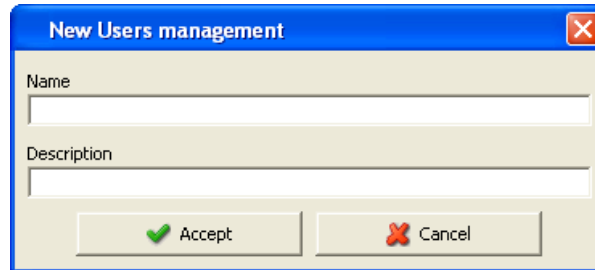


For more information on the map of binary variables and its configuration consult the device manual.

1.39 GUSERS

The GUSERS driver enables you to create users to whom tags and permissions can be assigned for the different energy recharging points managed by the application.

The following dialogue box appears on adding the GUSERS driver:



The name will allow distinction between several GUSERS drivers that could be working simultaneously in the same application, since it will appear below each corresponding icon.

1.39.1 Driver options

Options menu:



Driver parameters



User Management

1.39.1.1 Driver Parameters

This screen allows you to configure whether or not the driver is visible for the PowerStudio client.

It must be remembered that although the driver may not be visible directly, it will still operate fully.

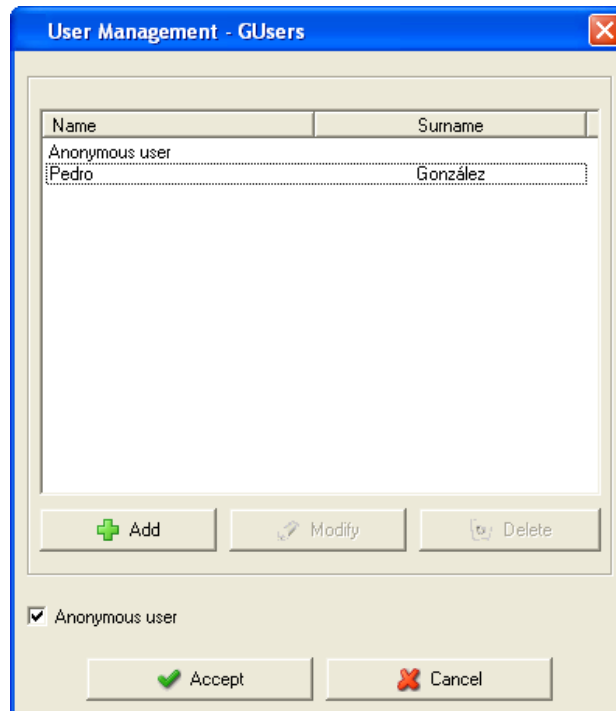
1.39.1.2 User management

Allows you to add, remove and modify users who will subsequently be managed from the application. Said users may have tags associated to them and permissions can be assigned for the different recharging points to which they will have access.

An anonymous user may be defined to which we can only assign devices (not tags).

If an anonymous user exists, all tags, regardless of whether they belong to a user or not, will have access to the devices assigned to them.

User management screen:



Name	Surname
Anonymous user	
Pedro	González

☒ Anonymous user

The ☒ **Usuario anónimo** check box can activate or disable management of the devices to which all users will have access. If the check box is enabled, the allocation of devices to the anonymous user will be accessible as if it was any other user. If the check box is disabled, only those tags assigned to the user will have permissions and on the devices those to which the user has been granted access.

User management (add/modification) screen:

The dialog box 'User Management - GUsers' contains the following fields and controls:

- Name:** Text box containing 'Pedro'.
- Surname:** Text box containing 'González'.
- Phone number:** Empty text box.
- E-mail:** Empty text box.
- Tags:** A list box containing 'Tag 1'.
- Buttons:** '+ Add' (green plus icon), 'Delete' (trash icon), 'Charging devices' (device icon), 'Accept' (green checkmark icon), and 'Cancel' (red X icon).

For each user the name and surnames (mandatory) can be stored, as well as the telephone number and e-mail address.

A list of the tags assigned to this user can also be managed.

Screen for adding a tag to a user:

The dialog box 'User Management - GUsers' contains the following fields and controls:

- Name:** Text box containing 'Tag 2'.
- Code:** Empty text box.
- Manual entering:** A checkbox that is currently unchecked.
- Lectores:** A section containing a 'Lector' dropdown menu with a single entry '1'.
- Buttons:** 'Read' (disabled), 'Accept' (green checkmark icon), and 'Cancel' (red X icon).

Where:

- Name: Is the name of the tag (descriptive name).
- Code: Is the internal code (unique) that can be entered manually (by enabling the check box ☒ Introducción manual) or by reading from one of the readers assigned to the system:

Once a name and code have been assigned to the tag, we can store it for the user via the



button.

The system can have as many recharging devices as CCL and/or X2 equipment.

The GUSERS driver can be used to assign devices to users thus activating the possibility that said users perform recharging in the devices they have assigned.

Screen for assigning recharging devices to a user:

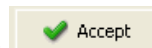
All the devices in the system appear in the windows (left and right):

- The left window contains the devices in which the user can recharge
- The right window contains the devices in which they cannot recharge (except, of course, when there is an anonymous user and they have one of these devices associated)

To authorise devices, select them in the right window and press the << button to move them to the left window.

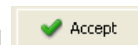
To unauthorise devices, select them in the left window and press the >> button to move them to the right window.

Once the modifications have been completed press the

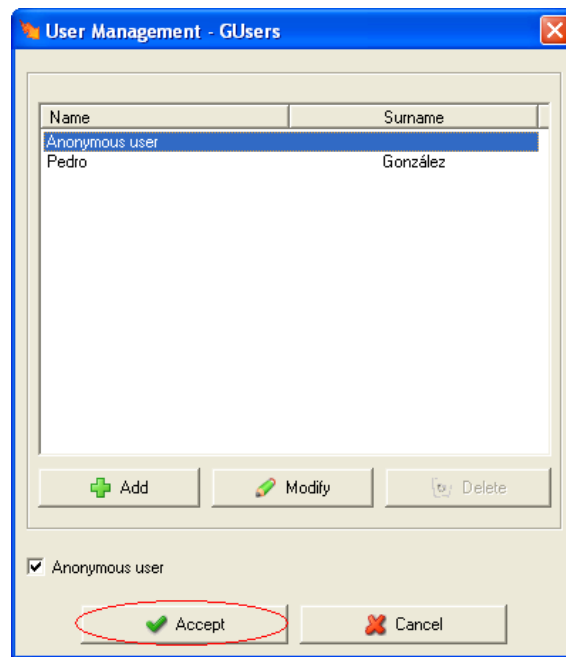


button.

The modifications made in the user management driver will not have effect until



is pressed in the initial window:



1.40 LM-24 M

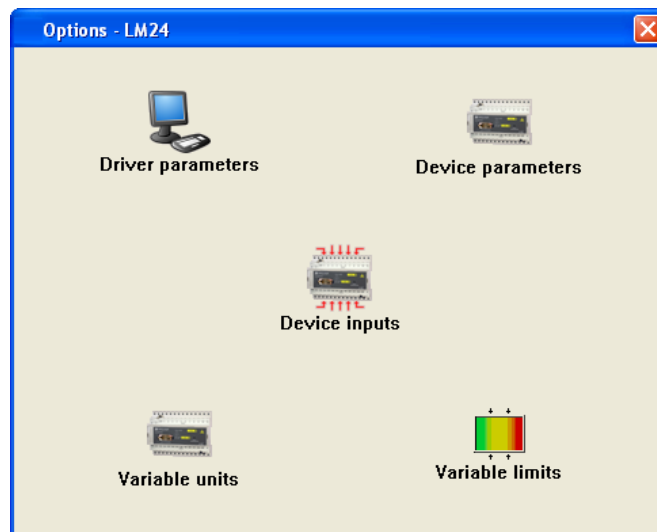
This software only communicates with LM-24 M devices.

1.40.1 Driver options

The options of the LM-24 M can be accessed from

- *View Menu*: Refer to 'Editor manual'.
- *Toolbar*: Refer to 'Editor manual'.

Options menu:



1.40.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on 'Accept' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

LM-24 configuration

Device Information

Peripheral number	Model
255	LM - 24 - M
Identifier	Version
LM24	19
Description	

Meters

1	1	7	0	13	0	19	0
2	1	8	0	14	0	20	0
3	1	9	0	15	0	21	0
4	1	10	0	16	0	22	0
5	0	11	0	17	0	23	0
6	0	12	0	18	0	24	0

☒ Load values in device meters

Accept Cancel

PowerStudio

Device Information	
Peripheral number	Model
255	LM - 24 - M
Identifier	Version
LM24	19
Description	

Shows general information.

Meters			
1	1	7	0
2	1	8	0
3	1	9	0
4	1	10	0
5	0	11	0
6	0	12	0
13	0	14	0
15	0	16	0
17	0	18	0
19	0	20	0
21	0	22	0
23	0	24	0

☒ Load values in device meters

This part of the configuration corresponds to the device counters. ☒ If the selector, is checked, on sending the configuration the energy counter will be loaded with the values entered into the corresponding boxes.

1.40.1.2 Device inputs

For each of the inputs of the LM-24 M, three variables will be available, a digital display to show the status of the input (open / closed), a counter variable to show the number of pulses detected at the input, and finally a flow variable calculated by the software as an estimate of the pulse frequency on the input during a space of time.

By means of this dialogue the LM-24 M inputs can be configured.

Input configuration			
Meters Digital inputs Flow			
Inputs from 1 to 12		Inputs from 13 to 24	
	Description	Unit	Factor
1			1
2			1
3			1
4			1
5			1
6			1
7			1
8			1
9			1
10			1
11			1
12			1

Accept Cancel

Using the **Meters** | **Digital inputs** | **Flow** display configuration of the different types of variables can be configured. The previous image shows the configuration of the counters, where:

- **Description:** Alphanumeric type which permits a brief description of the counter so it can be identified better.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the counter is displayed to be entered.
- **Factor:** Multiplier value of each input pulse.

For digital inputs:

	Description
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

- **Description:** Alphanumeric type data which permits a brief description of the digital input to be entered for better identification.

Finally for the flow configuration:

	Description	Unit	Factor	Time (min)	Calculation window (s)
<input checked="" type="checkbox"/> 1			1	1	30
<input type="checkbox"/> 2			1	1	30
<input type="checkbox"/> 3			1	1	30
<input checked="" type="checkbox"/> 4			1	1	30
<input type="checkbox"/> 5			1	1	30
<input type="checkbox"/> 6			1	1	30
<input checked="" type="checkbox"/> 7			1	1	30
<input type="checkbox"/> 8			1	1	30
<input type="checkbox"/> 9			1	1	30
<input type="checkbox"/> 10			1	1	30
<input type="checkbox"/> 11			1	1	30
<input type="checkbox"/> 12			1	1	30

Checking the selector ☒ will activate the flow variable. Remember if the selector is not checked it will not be possible to view the flow value of the corresponding GL-24 M input.

- **Description:** Alphanumeric type data which permits a brief description of the flow to be entered for better identification.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the flow is shown to be entered.
- **Factor:** Multiplier value of each input pulse.
- **Time:** Time in minutes for calculating the flow value.
- **Calculation window:** Time window, in seconds, that the software will use to calculate an estimate of the flow, taking into account the value of the device counter.

1.40.1.3 Variable limits

LM-24 limits setup

Inputs from 1 to 12

Inputs from 13 to 24

	Alarm	Pre alarm	Nominal	Pre alarm	Alarm
Flow 1	1	1	0	1	1
Flow 2	1	1	0	1	1
Flow 3	1	1	0	1	1
Flow 4	1	1	0	1	1
Flow 5	1	1	0	1	1
Flow 6	1	1	0	1	1
Flow 7	1	1	0	1	1
Flow 8	1	1	0	1	1
Flow 9	1	1	0	1	1
Flow 10	1	1	0	1	1
Flow 11	1	1	0	1	1
Flow 12	1	1	0	1	1

Minimum (%)

Maximum (%)

Accept

Cancel

Limits can only be defined for flows that are enabled.

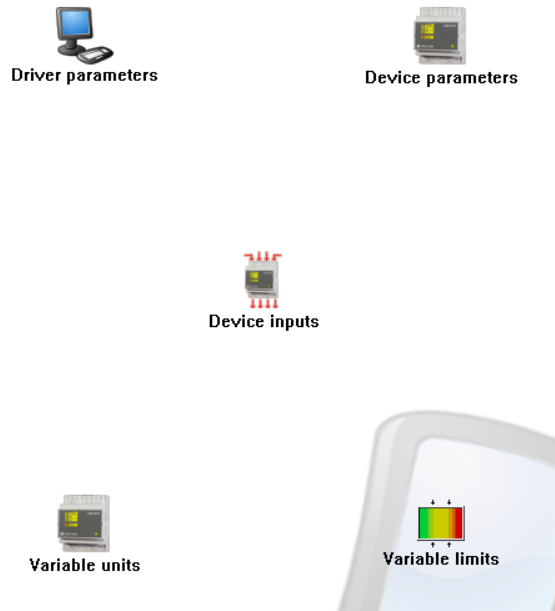
Through this dialogue the nominal value of flow type counters, as well as a series of margins to display on screen when a variable measures unusual values can be configured.

The ‘*Variable limits*’ option is explained in detail in section 1.1.3 Variable limits.

1.41 LM4A

1.41.1 Driver options

Options menu:



The '*Variable units*' and '*Variable limits*' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.41.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

The image shows the 'LM-4 A configuration' dialog box with the following fields and controls:

- Device Information** (Group Box):
 - Peripheral number: 2
 - Model: LM-4 A
 - Identifier: lm4a
 - Version: ?
 - Description: (Empty text field)
- Relay Timer** (Group Box):
 - 1: 200 x 20 ms = 4000 ms
 - 2: 100 x 20 ms = 2000 ms
- Meters** (Group Box):
 - 1: (Empty text field)
 - 2: (Empty text field)
 - ☐ Load values in device meters
- Buttons**:
 - Accept (with a green checkmark icon)
 - Cancel (with a red X icon)

Device Information	
Peripheral number	Model
2	LM-4 A
Identifier	Version
lm4a	?
Description	

Displays general information.

Relay Timer	
1	200 x 20 ms = 4000 ms
2	100 x 20 ms = 2000 ms

Configuration of the pulse duration that can be generated with the digital outputs of the device.

Meters	
1	
2	
<input type="checkbox"/> Load values in device meters	

This part of the configuration corresponds to the device meters. If the selector ☒ is checked, on sending the configuration the energy meter will be loaded with the values entered into the corresponding boxes.

1.41.1.2 Device inputs

For each of the LM-4A inputs there will be three variables, one digital to display the input status (open/closed), a meter variable to display the number of pulses detected in the input and finally one flow variable calculated by the software as an estimation of the pulse frequency produced in the input within a period of time.

This dialogue box can be used to configure the LM-4A inputs and outputs.

Input configuration			
	Description	Unit	Factor
1			1
2			1

Buttons:

Use **Meters** | **Digital inputs** | **Digital outputs** | **Flow** | **Analog inputs** to change the display of the configuration of the different types of variables which can be configured. The previous image shows the configuration of the meters.

- **Description:** Alphanumeric type which permits a brief description of the meter so it can be identified better.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the meter is displayed to be entered.
- **Factor:** Multiplier value of each input pulse.

For digital inputs:

Input configuration

Meters | Digital inputs | Digital outputs | Flow | Analog inputs

Description

1

2

Accept Cancel

- **Description:** Alphanumeric type data which permits a brief description of the digital input to be entered for better identification.

For digital outputs:

Input configuration

Meters | Digital inputs | Digital outputs | Flow | Analog inputs

Description

1

2

Accept Cancel

- **Description:** Alphanumeric type data which permits a brief description of the digital output to be entered for better identification.

For the flow configuration

Input configuration

Meters | Digital inputs | Digital outputs | Flow | Analog inputs

Description Unit Factor Time (min) Calculation window (s)

☒ 1

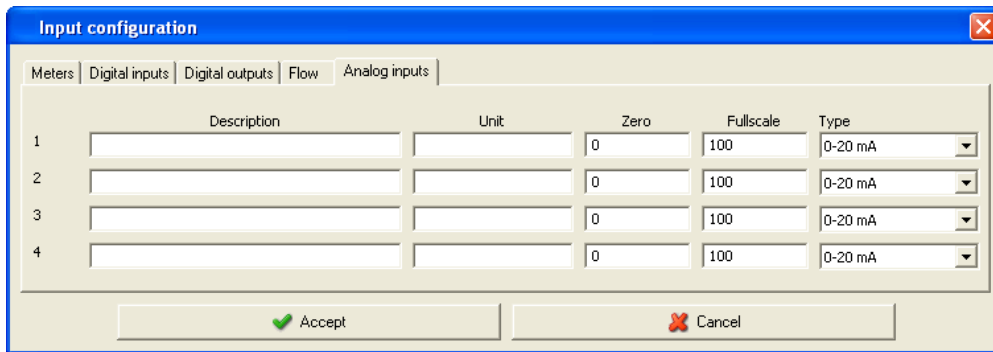
☐ 2

Accept Cancel

Checking the selector ☒ will activate the flow variable. It must be remembered that if this selector is not activated it will not be possible to display the flow value for the corresponding LM-4A input.

- **Description:** Alphanumeric type data which permits a brief description of the flow to be entered for better identification.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the flow is shown to be entered.
- **Factor:** Multiplier value of each input pulse.
- **Time:** Time in minutes for calculating the flow value.
- **Calculation window:** Time window, in seconds, that the software will use to calculate an estimate of the flow, taking into account the value of the device meter.

Finally, for the analogue inputs:

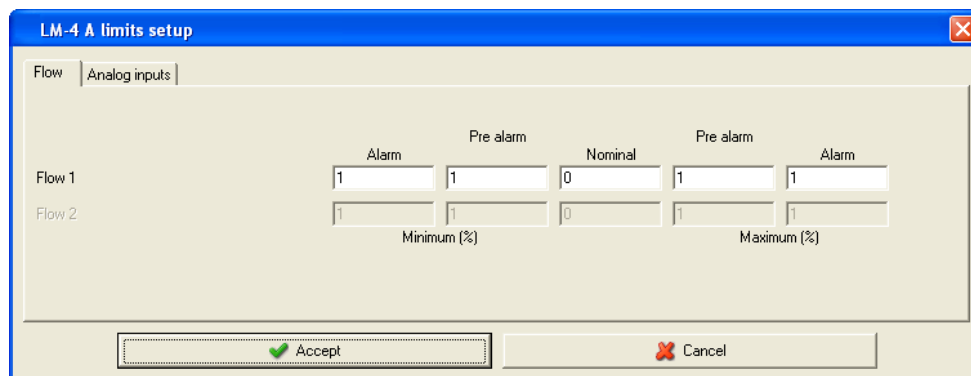


The 'Input configuration' dialog box has tabs for Meters, Digital inputs, Digital outputs, Flow, and Analog inputs. The 'Analog inputs' tab is active, showing a table with 4 rows. Each row has columns for Description, Unit, Zero, Fullscale, and Type. The 'Type' column has a dropdown menu with '0-20 mA' selected. At the bottom are 'Accept' and 'Cancel' buttons.

	Description	Unit	Zero	Fullscale	Type
1			0	100	0-20 mA
2			0	100	0-20 mA
3			0	100	0-20 mA
4			0	100	0-20 mA

- **Description:** Alphanumeric type data which allows a brief description of the analogue input for better identification.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the analogue input is shown to be entered.
- **Zero:** Starting value for the scale of the analogue input
- **Fullscale:** Maximum value for the scale of the analogue input
- **Type:** Type of input. Can be 0-20mA or 4-20mA. If it is 0-20mA, 0mA will correspond with the value indicated in “zero”, and 20mA with the value indicated in “Fullscale”. In the same way, an input of type 4-20mA, when it receives 4mA the value indicated in “zero” will be indicated, and in the case of 20mA the value in “Fullscale”.

1.41.1.3 Variable limits



The 'LM-4 A limits setup' dialog box has tabs for Flow and Analog inputs. The 'Flow' tab is active, showing a table with 2 rows for Flow 1 and Flow 2. Each row has columns for Alarm, Pre alarm, Nominal, Pre alarm, and Alarm. The 'Alarm' columns have a dropdown menu with '1' selected. The 'Pre alarm' columns have a dropdown menu with '1' selected. The 'Nominal' column has a dropdown menu with '0' selected. The 'Pre alarm' columns have a dropdown menu with '1' selected. The 'Alarm' columns have a dropdown menu with '1' selected. At the bottom are 'Accept' and 'Cancel' buttons.

	Alarm	Pre alarm	Nominal	Pre alarm	Alarm
Flow 1	1	1	0	1	1
Flow 2	1	1	0	1	1

Limits can only be defined for flows that are enabled.

Through this dialogue box, the nominal value of flow type meters, as well as a series of margins to display on screen when a variable measures unusual values can be configured.

The ‘*Variable limits*’ option is explained in detail in section 1.1.3 Variable limits.

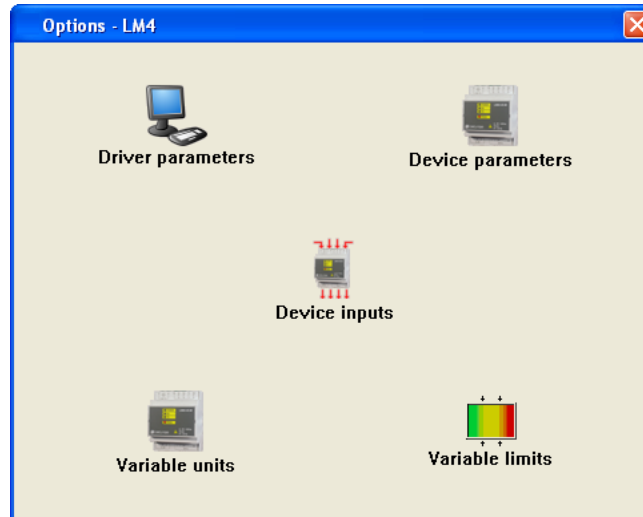
1.42 LM4

1.42.1 Driver options

The LM4 options can be accessed from:

- *View Menu*: Refer to 'Editor manual'.
- *Toolbar*: Refer to 'Editor manual'.

Options menu:



1.42.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

LM-4 configuration

Device Information

Peripheral number	Model
33	LM4 - M
Identifier	Version
LM4	1.10
Description	

Relay Timer

1	200	x 20 ms = 4000 ms	3	50	x 20 ms = 1000 ms
2	100	x 20 ms = 2000 ms	4	25	x 20 ms = 500 ms

Meters

1	12	3	161
2	2783	4	150

☒ Load values in device meters

Accept Cancel

Device Information	
Peripheral number	Model
33	LM4 - M
Identifier	Version
LM4	1.10
Description	

Shows general information.

Relay Timer	
1	200 x 20 ms = 4000 ms
2	100 x 20 ms = 2000 ms
3	50 x 20 ms = 1000 ms
4	25 x 20 ms = 500 ms

Configuration of the pulse duration that can be generated with the digital outputs of the device.

Meters	
1	12
2	2783
3	161
4	150

☒ Load values in device meters

This part of the configuration corresponds to the device counters. ☒ If the selector is checked, on sending the configuration the energy counter will be loaded with the values entered into the corresponding boxes.

1.42.1.2 Device inputs

For each of the inputs of the LM4, three variables will be available: a digital display to show the status of the input (open / closed), a counter variable to show the number of pulses detected at the input, and finally a flow variable calculated by the software as an estimate of the pulse frequency on the input during a period of time.

Using this dialogue the inputs and outputs of the LM4 can be configured.

Input configuration				
	Meters	Digital inputs	Digital outputs	Flow
Description	Unit	Factor		
1		1		
2		1		
3		1		
4		1		

Using the **Meters** | **Digital inputs** | **Digital outputs** | **Flow** display configuration of the different types of variables can be configured. The previous image shows the configuration of the counters, where:

- **Description:** Alphanumeric type which permits a brief description of the counter so it can be identified better.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the counter is displayed to be entered.
- **Factor:** Multiplier value of each input pulse.

For digital inputs:

	Description
1	
2	
3	
4	

Accept Cancel

- **Description:** Alphanumeric type data which permits a brief description of the digital input to be entered for better identification.

For digital outputs:

	Description
1	
2	
3	
4	

Accept Cancel

- **Description:** Alphanumeric type data which permits a brief description of the digital output to be entered for better identification.

Finally for the flow configuration:

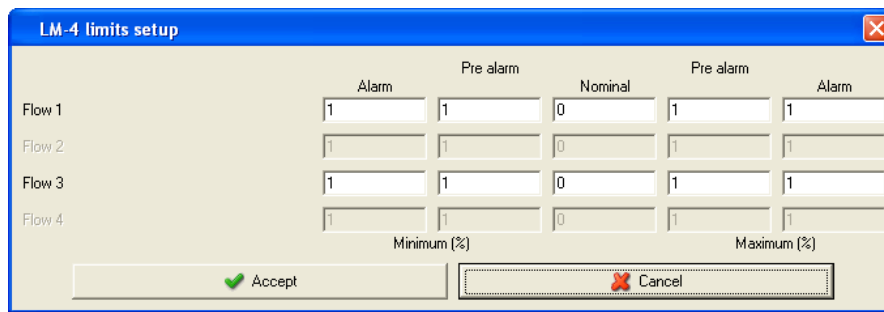
	Description	Unit	Factor	Time (min)	Calculation window (s)
<input checked="" type="checkbox"/> 1			1	1	30
<input type="checkbox"/> 2			1	1	30
<input checked="" type="checkbox"/> 3			1	1	30
<input type="checkbox"/> 4			1	1	30

Accept Cancel

☒ Checking the selector ; will activate the flow variable. Remember if this selector is not checked it will not be possible to view the flow value of the corresponding LM4 input.

- **Description:** Alphanumeric type data which permits a brief description of the flow to be entered for better identification.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the flow is shown to be entered.
- **Factor:** Multiplier value of each input pulse.
- **Time:** Time in minutes for calculating the flow value.
- **Calculation window:** Time window, in seconds, that the software will use to calculate an estimate of the flow, taking into account the value of the device counter.

1.42.1.3 Variable limits



The dialog box titled "LM-4 limits setup" contains a table for configuring limits for four flows. The table has five columns: Alarm, Pre alarm, Nominal, Pre alarm, and Alarm. The rows are labeled Flow 1, Flow 2, Flow 3, and Flow 4. Below the table, there are two buttons: "Accept" with a green checkmark and "Cancel" with a red X. The "Accept" button is highlighted.

	Alarm	Pre alarm	Nominal	Pre alarm	Alarm
Flow 1	1	1	0	1	1
Flow 2	1	1	0	1	1
Flow 3	1	1	0	1	1
Flow 4	1	1	0	1	1

Minimum (%) Maximum (%)

Accept Cancel

Limits can only be defined for flows that are enabled.

Through this dialogue the nominal value of flow type counters, as well as a series of margins to display on screen when a variable measures unusual values can be configured.

The 'Variable limits' option is explained in detail in section 1.1.3 Variable limits.

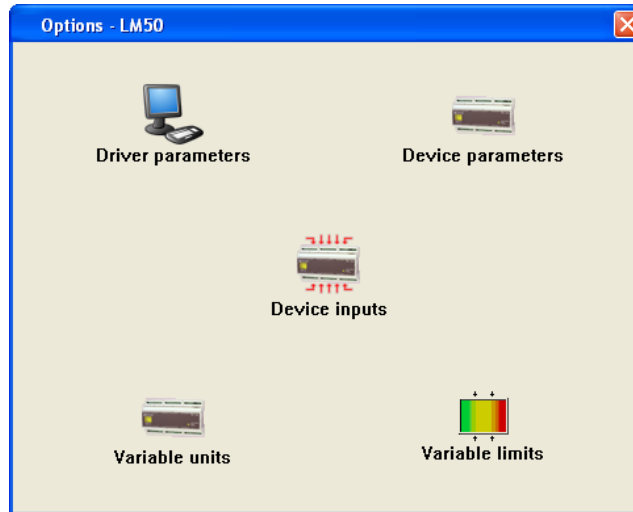
1.43 LM50-TCP

1.43.1 Driver options

You can access the LM50-TCP options from:

- *View Menu*: Refer to 'Editor manual'.
- *Toolbar*: Refer to 'Editor manual'.

The following is the options menu:



1.43.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on 'Accept' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

The 'LM50-TCP configuration' dialog box displays device information and a table of meters. The device information section shows:

Peripheral number	1	Model	LM50-TCP
Identifier	LM50	Version	V1.14
Description			

The 'Meters' section contains a table with 10 rows and 5 columns of input fields. The values are as follows:

1	1	11	0	21	0	31	0	41	0
2	0	12	0	22	0	32	0	42	0
3	0	13	0	23	0	33	0	43	0
4	0	14	0	24	0	34	0	44	0
5	0	15	0	25	0	35	0	45	0
6	0	16	0	26	0	36	0	46	0
7	0	17	0	27	0	37	0	47	0
8	0	18	0	28	0	38	0	48	0
9	0	19	4294967040	29	0	39	0	49	0
10	0	20	65535	30	0	40	0	50	0

At the bottom, there is a checkbox labeled 'Load values in device meters' which is checked. Below the checkbox are two buttons: 'Accept' (with a green checkmark icon) and 'Cancel' (with a red X icon).

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Device Information

Peripheral number	Model
1	LM50-TCP
Identifier	Version
LM50	V1.14
Description	

Shows general information.

Meters

1	1	11	0	21	0	31	0	41	0
2	0	12	0	22	0	32	0	42	0
3	0	13	0	23	0	33	0	43	0
4	0	14	0	24	0	34	0	44	0
5	0	15	0	25	0	35	0	45	0
6	0	16	0	26	0	36	0	46	0
7	0	17	0	27	0	37	0	47	0
8	0	18	0	28	0	38	0	48	0
9	0	19	4294967040	29	0	39	0	49	0
10	0	20	65535	30	0	40	0	50	0

☒ Load values in device meters

This part of the configuration corresponds to the device counters. If selector ☒ is checked, on sending the configuration the counters that have been modified, will be loaded with the values entered into the corresponding boxes.

1.43.1.2 Inputs

For each of the LM50-TCP inputs three variables will be available, a digital one to show the input status (open / closed), a counter variable to show the number of pulses detected in the input and finally a flow variable calculated by the software as an estimate of the pulse frequency that occurs in the input during a period of time.

By means of this dialogue the LM50-TCP input can be configured.

	Description	Unit	Factor
1			1
2			1
3			1
4			1
5			1
6			1
7			1
8			1
9			1
10			1

Using the **Contadores** | **Entradas digitales** | **Caudales** display configuration of the different types of variables can be configured. The previous image shows the configuration of the counters, where:

- **Description:** Alphanumeric type which permits a brief description of the counter so it can be identified better.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the counter is displayed to be entered.
- **Factor:** Multiplier value of each input pulse.

For digital inputs:

	Description
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

- **Description:** Alphanumeric type data which permits a brief description of the digital input to be entered for better identification.

Finally for the flow configuration:

Input configuration					
Meters Digital inputs Flow					
Inputs from 1 to 10 Inputs from 11 to 20 Inputs from 21 to 30 Inputs from 31 to 40 Inputs from 41 to 50					
	Description	Unit	Factor	Time (min)	Calculation window (s)
<input checked="" type="checkbox"/> 1			1	1	30
<input type="checkbox"/> 2			1	1	30
<input checked="" type="checkbox"/> 3			1	1	30
<input type="checkbox"/> 4			1	1	30
<input checked="" type="checkbox"/> 5			1	1	30
<input type="checkbox"/> 6			1	1	30
<input type="checkbox"/> 7			1	1	30
<input type="checkbox"/> 8			1	1	30
<input type="checkbox"/> 9			1	1	30
<input type="checkbox"/> 10			1	1	30

Accept Cancel

Checking the selector ☒ will activate the flow variable. Remember that if this selector is not checked it will not be possible to display the flow value of the corresponding LM50-TCP input.

- **Description:** Alphanumeric type data which permits a brief description of the flow to be entered for better identification.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the flow is shown to be entered.
- **Factor:** Multiplier value of each input pulse.
- **Time:** Time in minutes for calculating the flow value.
- **Calculation window:** Time window, in seconds, that the software will use to calculate an estimate of the flow, taking into account the value of the device counter.

1.43.1.3 Variable limits

LM50-TCP limits setup

Inputs from 1 to 10 | Inputs from 11 to 20 | Inputs from 21 to 30 | Inputs from 31 to 40 | Inputs from 41 to 50

	Alarm	Pre alarm	Nominal	Pre alarm	Alarm
Flow 1	1	1	0	1	1
Flow 2	1	1	0	1	1
Flow 3	1	1	0	1	1
Flow 4	1	1	0	1	1
Flow 5	1	1	0	1	1
Flow 6	1	1	0	1	1
Flow 7	1	1	0	1	1
Flow 8	1	1	0	1	1
Flow 9	1	1	0	1	1
Flow 10	1	1	0	1	1

Minimum (%)Maximum (%)

AcceptCancel

Limits can only be defined on flow type counters.

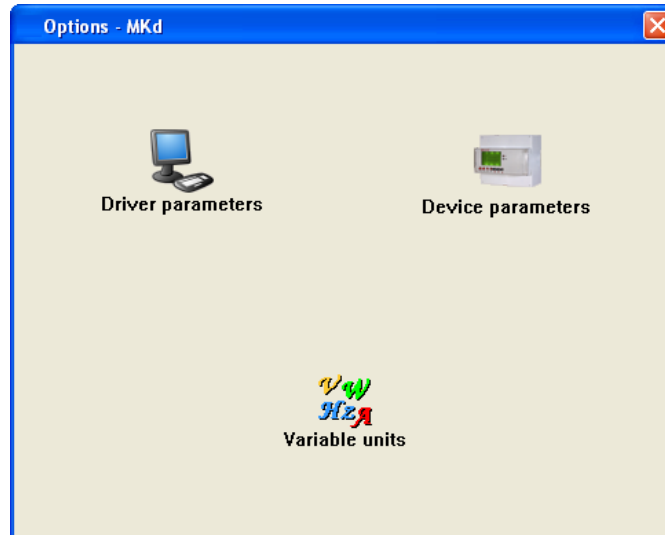
Through this dialogue the nominal value of flow type counters, as well as a series of margins to display on screen when a variable measures unusual values can be configured.

The ‘*Variable limits*’ option is explained in detail in section 1.1.3 Variable limits.

1.44 MKD

1.44.1 Driver options

Options menu:



The 'Variable units' option is detailed in section 1.1.2 Variable Units.

1.44.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

Mk D configuration

Device Information

Peripheral number	Model
1	Mk D
Identifier	Version
MKd	9.99
Description	

Visualization in the device

☐ Omit reactive measure

☐ Omit partial counter devices

Current direction

☐ Up ☒ Down

Backlight time

10 Seconds

Partial energy counter devices

Input configuration

Operating mode

☐ Tariffs ☒ Digital inputs

Pulses meters

Input 1

Mode: ☒ Pulses ☐ State

Pulses number: 99,999

Input 2

Mode: ☒ Pulses ☐ State

Pulses number: 99,999

Number of quadrants

☐ 2 ☒ 4

Active output

Wh / pulse: 0

Variable: ☒ Active - Consumed (+) ☐ Active - Generated (-)

Reactive output

VArh / pulse: 0

Variable: ☒ Inductive - Consumed (+) ☐ Capacitive - Consumed (+) ☐ Inductive - Generated (-) ☐ Capacitive - Generated (-)

Buttons:

Device Information	
Peripheral number	Model
1	Mk D
Identifier	Version
MKd	9.99
Description	

Shows general information.

Visualization in the device	
<input type="checkbox"/>	Omit reactive measure
<input type="checkbox"/>	Omit partial counter devices

Device screen display options.


- **Omit reactive measurement:** The reactive measurements are not shown on the device screen, although they will continue to be displayed on the software display screens.
- **Omit partial counters:** Partial counter measurements are not shown on the device screen or the software display screen.

Current direction	
<input type="radio"/>	Up
<input checked="" type="radio"/>	Down

Flow direction

Backlight time	
10	Seconds

Configuration of the "*backlight*" disconnection. The value should oscillate between 0 and 10 seconds.

Partial energy counter devices	
	

Click the button to start all the device partial counters.

Number of quadrants	
<input type="radio"/>	2
<input checked="" type="radio"/>	4


Configuration of the number of quadrants. With 2 quadrants only the consumed energy counters will be taken into consideration; with 4 both the consumed and generated energy counters will be considered.

Active output	
Wh / pulse	
0	
Variable	
<input checked="" type="radio"/>	Active - Consumed (+)
<input type="radio"/>	Active - Generated (-)

Active energy output relay configuration. You may configure the number of Wh equivalent per output impulse and the variable that will be a measured to give this pulse. If the pulse value is 0, the output will be treated like a standard digital output, enabling its value to be forced from 0 to 1.

Reactive output	
VARh / pulse	
0	
Variable	
<input checked="" type="radio"/>	Inductive - Consumed (+)
<input type="radio"/>	Capacitive - Consumed (+)
<input type="radio"/>	Inductive - Generated (-)
<input type="radio"/>	Capacitive - Generated (-)

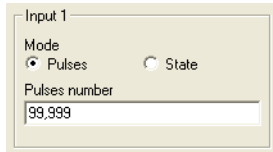
Reactive energy output relay configuration. The number of VARh equivalent per output pulse and the variable that will be a measured to give the pulse can be configured. If the pulse value is 0, the output will be treated like a standard digital output, enabling its value to be forced from 0 to 1.

Input configuration		
Operating mode		
<input type="radio"/> Tariffs		
<input checked="" type="radio"/> Digital inputs		
Pulses meters		
		
Input 1		Input 2
Mode		Mode
<input checked="" type="radio"/> Pulses		<input checked="" type="radio"/> Pulses
<input type="radio"/> State		<input type="radio"/> State
Pulses number		Pulses number
99,999		99,999

Configuration of the digital inputs of the device.



The inputs may be used as inputs for changing the rate or as digital inputs. Consult the device manual for more information on how changing the rate works



Configuration of one of the inputs when the operating mode is digital inputs. Inputs may be treated as pulse counters by selecting the '*Pulse*' mode; the parameter '*number of pulses*' will correspond to the multiplier factor of pulses counted at the input. When the selected mode is '*Status*' it will show the input status, open or closed, and will disable the corresponding counter.



Clicking this button will reset the device counter. As long as the working mode is digital inputs and the input mode is configured in pulses.

1.45 MK-LCD

1.45.1 Driver options

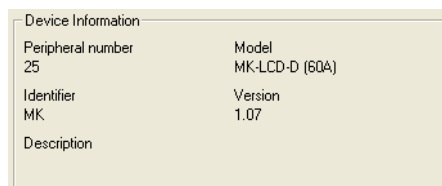
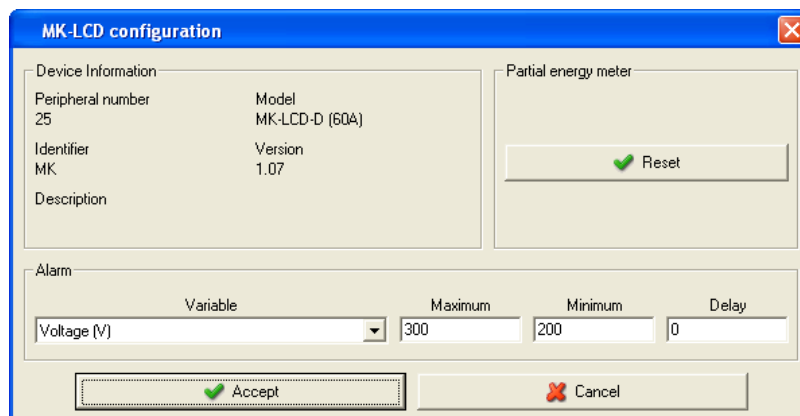
Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

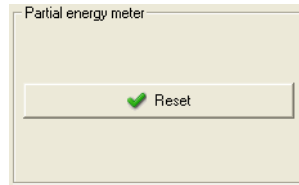
1.45.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

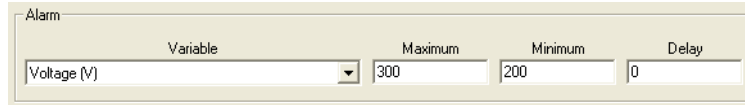


Shows general information.

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Clicking the button will reset the partial power counter to zero.

A dialog box titled "Alarm" with a light beige background. It contains four input fields: "Variable" (a dropdown menu showing "Voltage (V)"), "Maximum" (a text box with "300"), "Minimum" (a text box with "200"), and "Delay" (a text box with "0").

This section shows the configuration of the device relay output and the option to configure it with the desired values is given.

- **Variable:** The parameters associated with the relay are indicated in this field. The output is programd as an alarm, and any of the parameters measured by the device can be controlled. The maximum and minimum alarm unit values are indicated in brackets.
- **Max:** This box indicates the maximum value to be controlled.
- **Min:** This box indicates the minimum value to be controlled.
- **Delay:** Alarm delay in seconds. The maximum value is 9999 seconds.

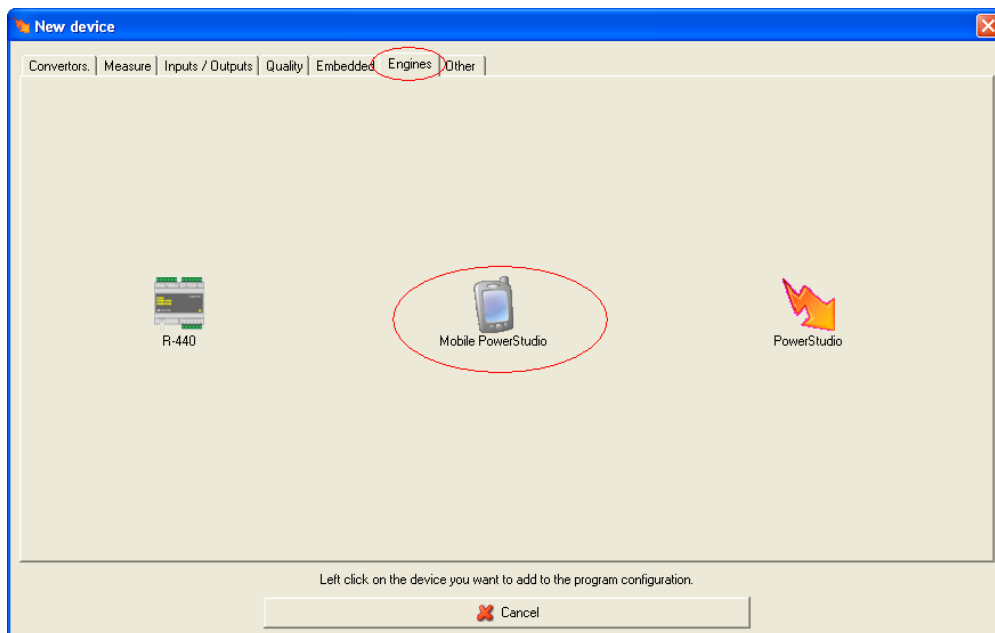
1.46 Mobile PS⁹

The MobilePS driver allows the connection of mobile devices (mobile telephones, PDAs, BlackBerrys, etc.) to the PowerStudio engine by configuring users and groups of variables to which they will have access.

Once the MobilePS driver has been configured, the mobile device will be able to perform searches for variable values and variable histories in the PowerStudio engine for which the driver has been configured.

1.46.1 Configuration of Mobile PS device

Use the devices menu to add a new Mobile PS as a first level device:



⁹ Only in Deluxe version

1.46.2 Driver options

Options menu:



Device parameters

1.46.2.1 Device parameters

This screen is used to configure the permissions for the different users in the modern application to display different groups of variables. We can:

- Create groups of up to five variables
- Assign a group of variables to one user (the user can view all the variables in this group)
- Modify assignments
- Delete assignments

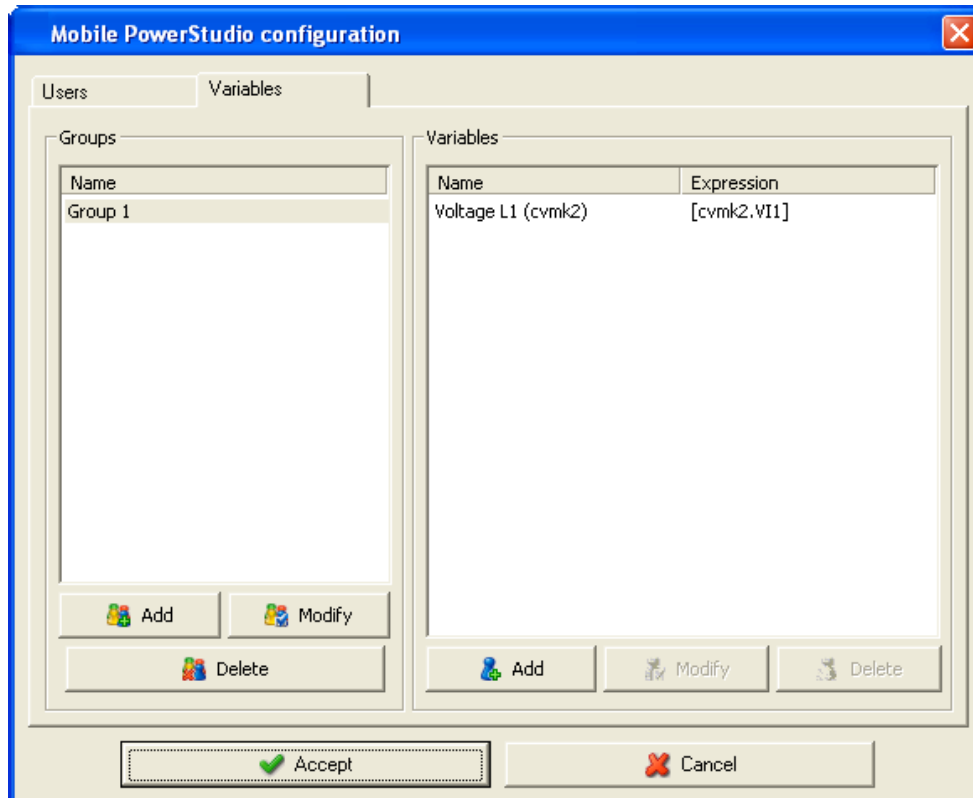
User name	Groups
Joseph	Group 1

Note:

All the modifications made impact on the relation between users and variables or groups of variables but never delete or modify the users or variables from the system. They simply modify the permissions relations between them.

The groups of variables must first of all be defined and once established, we can go to the user tab and define the relations between users and groups of variables.

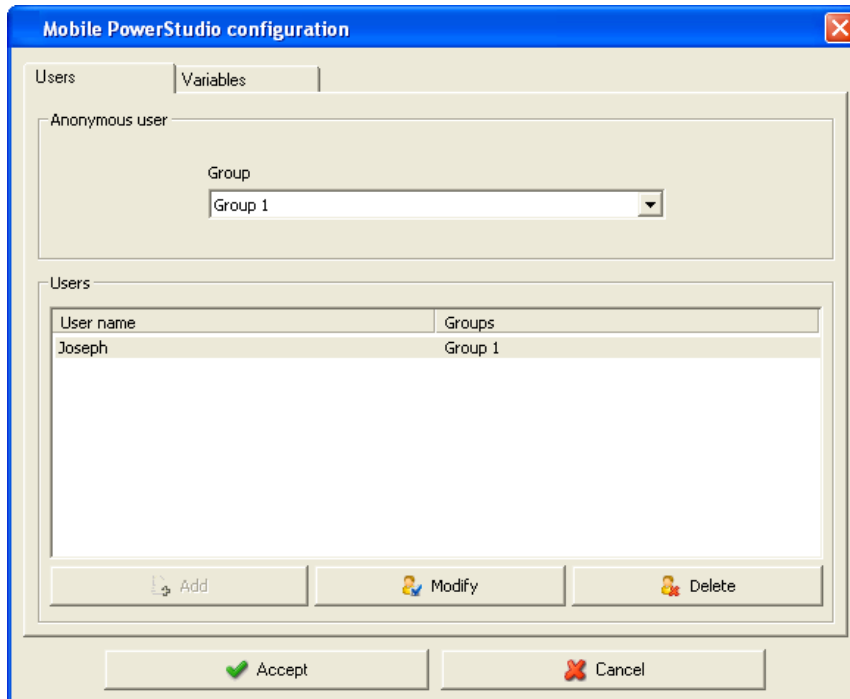
1.46.2.1.1 Variables




Allows you to define groups of variables. Each group can contain up to five variables and the variables can be measurement variables for any of the devices managed by the PowerStudio.

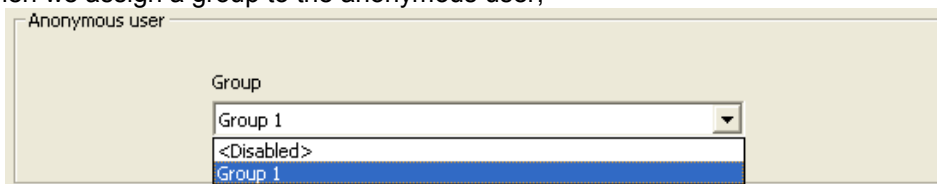
We can add, modify and delete groups, and for each group we can add, modify or delete variables.

1.46.2.1.2 Users



When we click on , we are adding a relation between one of the users in the system and a group of variables. In reality, we are giving this user permissions to view a certain group of variables.

When we assign a group to the anonymous user,



we are giving permissions to any user who connects with the PowerStudio engine to view all the variables assigned to this group.

1.46.3 Displaying values

When we connect a mobile device to the PowerStudio engine, we obtain a screen like the one below:



In said screen we can view the variables for the group of variables assigned to the user through which we authenticated the application.

1.47 MP3/MP4

1.47.1 Driver options

Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.47.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

MP3 configuration

Device Information

Peripheral number	Model
4	MP3-400 A
Identifier	Version
Mp3	0
Description	

Password

☐ Enable password

Password:

Repeat password:

Position

Current: ☒ By arrows ☐ Counterclockwise arrows

Phase: ☒ Order show in box ☐ 1 and 3 changed

Maximeter

Period: 15 Window type: Fixed

Unit: Apparent power III

Output pulses active energy relation

W/Hr x pulse

Output pulses reactive energy relation

W/Hr x pulse

Line frequency to measure

☒ L1 ☐ L2 ☐ L3

Voltage

☒ Single (phase-neutral) ☐ Compound (between phases)

Energy counters

Alarm

	Variable	kVarh / pulse	Minimum	Delay	Port
1	Inductive reactive energy L1 (kVarh)	100	0	0	Digital output 1
2	Voltage L2 (V)	50	50	1	Digital output 2

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Device Information	
Peripheral number	Model
4	MP3-400 A
Identifier	Version
Mp3	0
Description	

Shows general information.

Password
<input type="checkbox"/> Enable password
Password <input type="password"/>
Repeat password <input type="password"/>

Enables the password to be enabled or deactivated to block the configuration of the device.

Position	
Current	Phase
<input checked="" type="radio"/> By arrows <input type="radio"/> Counterclockwise arrows	<input checked="" type="radio"/> Order show in box <input type="radio"/> 1 and 3 changed

Configures the position of the device. The current as per the direction of the arrows, or its opposite, and the phases, as per the sequence shown on the box, or phases 1 and 3 swapped.

Differential protection	
Trigger current	Trip time
300 mA	100 ms

Configures the position of the device. The current as per the direction of the arrows, or its opposite, and the phases, as per the sequence shown on the box, or phases 1 and 3 swapped.

Maximeter	
Period	Window type
15	Fixed
Unit	
Apparent power III	
<input type="button" value="Maximeter reset"/>	

- **Period:** Is the integration period of the maximeter that can vary between 1 and 60 minutes.
- **Window type:** Type of window used to save the maximeter value, this can be fixed or sliding.
- **Unit:** The maximum demand can be calculated with active power III, apparent power III, or phase current depending on the device.
- **Maximeter reset:** When the button is pressed, the device maximeter goes to zero.

Output pulses active energy relation
0 W/Hr x pulse

Active energy output relay configuration. The relationship that will appear in the pulse output can be defined. Its value corresponds to the energy, in Wh, required to generate a pulse. If the pulse value is 0, it will be disabled.

Reactive energy output relay configuration. The relationship that will appear in the pulse output can be defined. Its value corresponds to the energy, in Wh, required to generate a pulse. If the pulse value is 0, it will be disabled.

Option to define the pulse width at the pulse output.

Clicking the button will reset the device energy counters to zero.

Use to select the voltage line from which to read the frequency.

Selecting the type of voltage calculated.

	Variable	kVarh / pulse	Minimum	Delay	Port
1	Inductive reactive energy L1 (kVarh)	100	0	0	Digital output 1
2	Voltage L2 (V)	50	50	1	Digital output 2

This section shows the configuration of the device relay output, and the option to configure it with the desired values is given. For MP3/MP4 the two relay outputs of these devices can be configured.

- **Variable:** The parameters associated with the relay are indicated in this field. The output is programmed as an alarm or energy pulse with any of the parameters measured by the device being able to be controlled. The maximum and minimum alarm unit values are indicated in brackets.
- **Max:** This box indicates the maximum value to be controlled. If an energy variable is selected, the value of each pulse will be indicated. This will be displayed as follows:

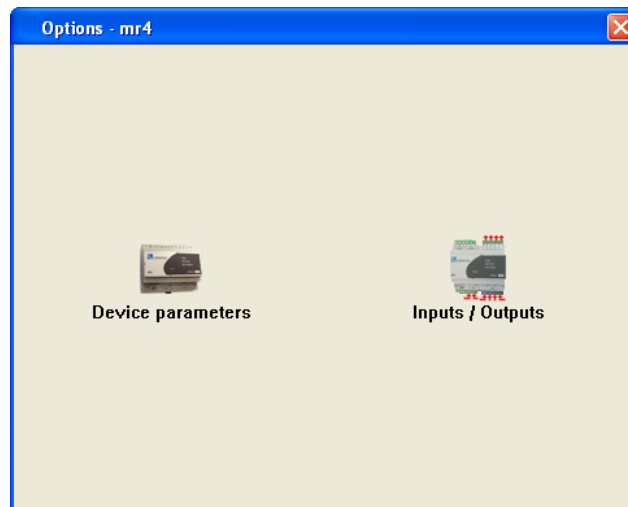
	Variable	kVarh / pulse	Minimum	Delay	Port
1	Inductive reactive energy L1 (kVarh)	100	0	0	Digital output 1

- **Min:** This box indicates the minimum value to be controlled. If you select an energy variable, this field will remain disabled.
- **Delay:** Alarm delay in seconds. The maximum value is 9999 seconds. This field will remain deactivated if an energy variable is chosen.
- **Port:** Output port on which the alarm will be monitored.

1.48 MR4

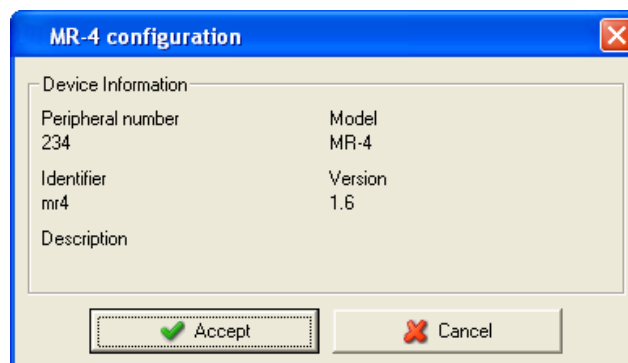
1.48.1 Driver options

Options menu:



1.48.1.1 Device parameters

This screen shows general information.



1.48.1.2 Inputs / outputs

This screen allows for names to be assigned to the digital inputs and outputs.

Configure inputs/outputs

Digital inputs

Description

1

2

3

4

5

6

7

8

Digital outputs

Description

1

2

3

4

Accept

Cancel

181

1.49 PLC800

1.49.1 Opciones del driver

Las opciones del dispositivo son las siguientes:



Driver parameters



Device parameters



Update.

1.49.1.1 Parámetros del dispositivo

Esta pantalla permitirá configurar los parámetros internos del dispositivo. Al abrir el diálogo el software leerá la configuración del dispositivo, al finalizar, si se pulsa 'Aceptar' y se han producido cambios el software enviará la información al dispositivo. En ningún caso se guardará esta información en el disco duro del PC.

PLC 800 configuration

Device Information:

Model	PLC800-U-1-2M00-12-0	Description	PLC800
Identifier	PLC800	Version	2.01

Change password of PLC 800: ☐

Password: Repeat password:

Cutoffs apply to all relays: ☐

ICP 1: ICP 2: ICP 3:

Serial number	ICP 1	ICP 2	ICP 3
144122311	26		
144122312	17		
144122316	13		

Buttons:

Device Information:

Model	PLC800-U-1-2M00-12-0	Description	PLC800
Identifier	PLC800	Version	2.01

Muestra información general.

Change password of PLC 800: ☐

Password: Repeat password:

Nos permite cambiar la contraseña con la que nos conectamos al PLC800. El usuario es concentrador, pero revisad la última versión del manual del dispositivo por si cambia.

Cutoffs apply to all relays ☐

ICP 1 ICP 2 ICP 3

Nos permite asignar la misma corriente de corte a todos los dispositivos que estén comunicando con el PLC800 a la vez. Basta con marcar el check de “Aplicar los valores de corte a todos los relés” y se habilitarán las cajas de las tres corrientes (ICP1, ICP2, ICP3). Al mismo tiempo se deshabilita la asignación de corrientes de forma independiente. Si algún dispositivo no tiene las tres corrientes de corte configurará las que tenga.

Serial number	ICP 1	ICP 2	ICP 3
144122311	26		
144122312	17		
144122316	13		

Si no hemos marcado la opción anterior la tabla de arriba estará activa para permitirnos poder cambiar las corrientes de corte (ICP) que queramos. Basta con hacer clic sobre la fila y columna deseada y dicha celda cambiará para poder ser editada. En las celdas vacías no se puede hacer clic. Esto indica que dicho dispositivo no dispone de esa corriente de corte. En la imagen vemos que los equipos sólo se les puede configurar la primera corriente de corte. Tener en cuenta que en la lista sólo aparecen los dispositivos con los que el PLC800 ha podido comunicar recientemente.

Las corrientes de corte sólo pueden ser valores enteros en Amperios.



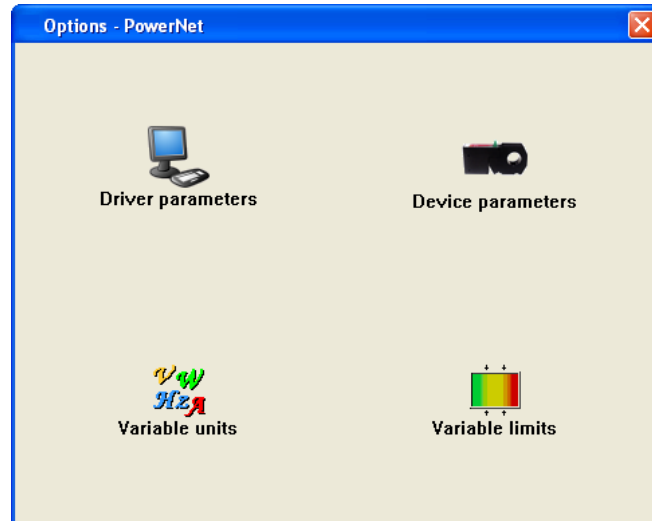
Al hacer clic en el botón actualizar forzaremos al PLC800 a que nos devuelva todos los dispositivos que tenga registrados y su estado. De esta forma el editor nos podrá ayudar en algunas tareas como mostrarnos los números de serie de los equipos conectados al PLC800 al usar el wizard para añadir variables. Para ello es necesario que el editor tenga comunicación con el motor y el motor con el PLC800.

Nota importante: El PLC800, debido a su funcionamiento, no nos permite ver en tiempo real los valores de las variables de los equipos que cuelgan por debajo. Como por ejemplo: el voltaje, la corriente, las energías, etc. Dichos valores son descargados del PLC800 cada cierto tiempo. Por defecto cada 15 minutos.

1.50 POWERNET

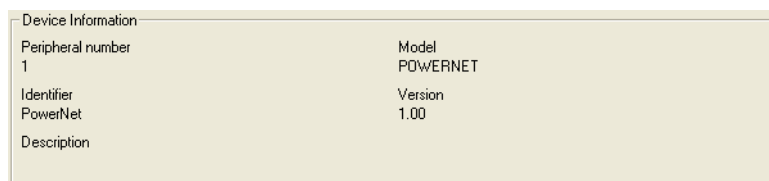
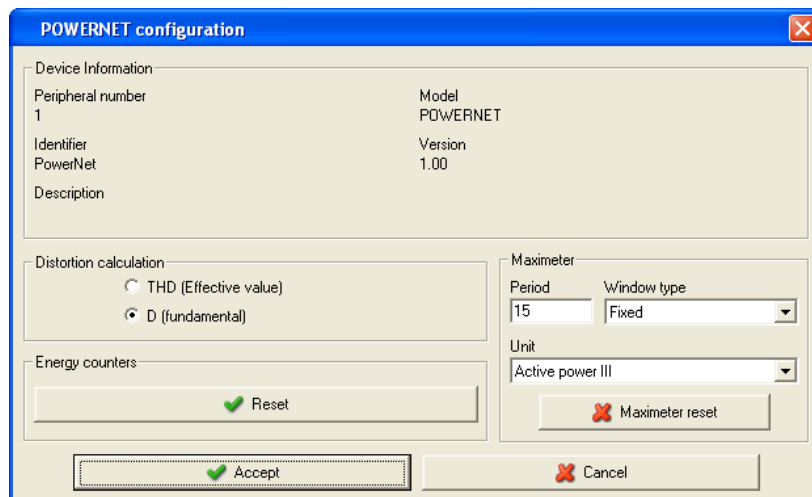
1.50.1 Driver options

Options menu:



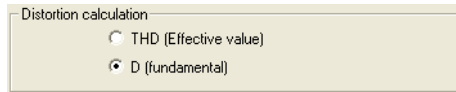
1.50.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.



Shows general information.

PowerStudio

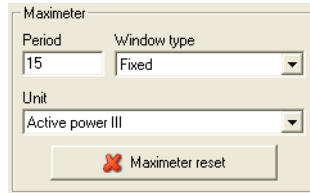


Distortion calculation

☐ THD (Effective value)

☒ D (fundamental)

Use this selector to configure the type of distortion the device will calculate.



Maximeter

Period: 15

Window type: Fixed

Unit: Active power III

Maximeter reset

Maximum demand will be activated in PowerNet devices with version 1.01 or higher of firmware.

- **Period:** This is the maximeter integration period and can vary between 1 and 60 minutes.
- **Window type:** Type of window used to save the maximeter value, this can be fixed or sliding.
- **Unit:** The maximum demand can be calculated with active power III, apparent power III, current III or current by phase depending on the device.
- **Maximeter reset:** When the button is pressed, the device maximeter resets to zero.



Energy counters

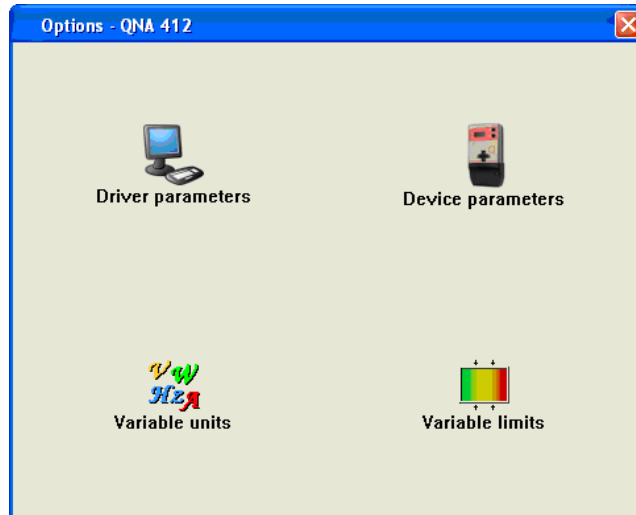
Reset

Clicking the button will reset the device energy counters to zero.

1.51 QNA 412/413

1.51.1 Driver options

Options menu:



1.51.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

Device Information	
Peripheral number	0
Model	QNA-412
Identifier	QNA 412
Serial number	0354511023
Description	
Version	8B2.09

Configuration	
Capture period (min.)	10
Primary voltage	1
Secondary voltage	1
Primary current	1
Secondary current	5
Primary neutral current	5
Secundario de corriente de neutro	5
Nominal voltage (V)	230
Nominal frequency (Hz)	50
Circuit	<input checked="" type="radio"/> Three-phase <input type="radio"/> Aron
Connection	<input type="radio"/> Triangle (3 threads) <input checked="" type="radio"/> Star (4 threads)

Password	
<input type="checkbox"/> Enable password to read	<input type="checkbox"/> Enable password to write
Password	Password
Repeat password	Repeat password

Quality	
Measure point	CIR_2
Commentary	CIRCONTROL_QNA2
Overvoltage threshold (%)	110
Overvoltage hysteresis (%)	2
Sag threshold (%)	90
Sag hysteresis (%)	2
Interruption threshold (%)	10
Interruption hysteresis (%)	2

Energy	
Capture period (min.)	15

Accept Cancel

PowerStudio

Device Information	
Peripheral number	Model
0	QNA-412
Identifier	Serial number
QNA 412	0354511023
Description	Version
	8B2.09

Shows information on the device.

Password	
<input type="checkbox"/> Enable password to read	<input type="checkbox"/> Enable password to write
Password	Password
Repeat password	Repeat password

Allows the password to be enabled or disabled to block both the reading and writing values and the configuration of the device.

Configuration	
Capture period (min.)	
10	
Primary voltage	Secondary voltage
1	1
Primary current	Secondary current
1	5
Primary neutral current	Secundario de corriente de neutro
5	5
Nominal voltage (V)	Nominal frequency (Hz)
230	50
Circuit	Connection
<input checked="" type="radio"/> Three-phase <input type="radio"/> Aron	<input type="radio"/> Triangle (3 threads) <input checked="" type="radio"/> Star (4 threads)

- **Capture period:** Configuration in minutes between records stored on the device.
- **Primary voltage:** Device primary voltage value.
- **Secondary voltage:** Device secondary voltage value.
- **Primary current:** Device primary current value.
- **Secondary current:** Device secondary current value.
- **Neutral primary current:** Device neutral primary current value.
- **Neutral secondary current:** Device neutral secondary voltage value.
- **Rated voltage:** Rated voltage of the equipment, with a 3-wire configuration the composite voltage should be programd and the single voltage on four wires. If the measurement is carried out through voltage transformers, the programd value must refer to the secondary.
- **Nominal frequency:** Nominal frequency of the device.
- **Circuit:** Enables the type of circuit to which it is connected to carry out the measurement to be chosen, whether it is connected to a three-phase device or if it only uses two current connectors for the measurement (Aron).
- **Connection:** Enables the type of connection to which it is connected to carry out the measurement to be chosen, whether delta (connection between phases, without neutral) or star (3-phase connection and neutral)

Quality	
Measure point	Commentary
CIR_2	CIRCONTROL_QNA2
Overvoltage threshold (%)	Overvoltage hysteresis (%)
110	2
Sag threshold (%)	Sag hysteresis (%)
90	2
Interruption threshold (%)	Interruption hysteresis (%)
10	2

- **Measurement point:** Brief description of the measurement point where the QNA is situated
- **Comments:** Brief description of the measurement point.
- **Overvoltage threshold:** Serves to program the overvoltage percentage. Each semi-cycle with an rms value exceeding this value will be understood as over voltage.
- **Overvoltage hysteresis:** Overvoltage hysteresis is where the start-up voltage is different from the end voltage of overvoltage. An overvoltage will start when the voltage threshold value is exceeded and will finish when it is lower than the value defined by the difference between the threshold and the hysteresis.
- **Gap threshold:** Serves to program the gap detection. Each semi-cycle with an rms value not reaching this defined value will be understood as a gap.
- **Gap Hysteresis:** Will define a gap hysteresis so that the initial voltage is different to the end of gap voltage. A gap will start when the voltage does not exceed the threshold value and will finish when this is lower than the value defined by the sum of the threshold and the hysteresis.
- **Interruption threshold:** defined as power off (absence of tension, interruption) the voltage drop below the value set.
- **Interruption hysteresis:** An interruption hysteresis is when the start-up voltage is different from the voltage interruption end. An interruption will begin when the voltage does not exceed the threshold value and ends when it exceeds the value defined by the sum of the threshold and hysteresis interruption.

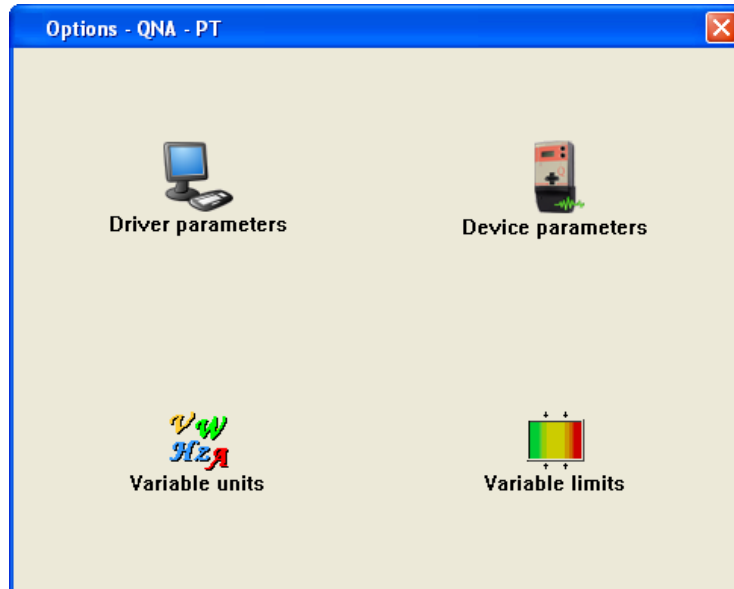
Energy
Capture period (min.)
15

Enables us to specify the energy capture time expressed in minutes.

1.52 QNA-PT

1.52.1 Driver options

Options menu:



1.52.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

QNA-PT configuration			
Device Information Peripheral number: 0 Identifier: QNA-PT Description:		Model : QNA-PT Serial number : 0354648003 Version : 0D2P20	
Configuration Capture period (min.): 10 Primary voltage: 1 Primary current: 5 Nominal voltage (V): 230 Nominal current (mA): 5.000 Circuit: <input checked="" type="radio"/> Three-phase <input type="radio"/> Aron		Secondary voltage: 1 Secondary current: 5 Nominal frequency (Hz): 50 Nominal power (W): 3.450 Connection: <input type="radio"/> Triangle (3 threads) <input checked="" type="radio"/> Star (4 threads)	
Password <input type="checkbox"/> Enable password to read <input type="checkbox"/> Enable password to write Password: <input type="text"/> Repeat password: <input type="text"/>		Password: <input type="text"/> Repeat password: <input type="text"/>	
Quality Measure point: MEDIDA00 Overvoltage threshold (%): 110 Sag threshold (%): 90 Interruption threshold (%): 10 Minimum frequency (Hz): 49		Commentary: COMENTARIO000000 Overvoltage hysteresis (%): 2 Sag hysteresis (%): 2 Interruption hysteresis (%): 2 Maximum frequency (Hz): 51	
<input checked="" type="button" value="Accept"/>		<input type="button" value="Cancel"/>	

PowerStudio

Device Information	
Peripheral number	Model
0	QNA-PT
Identifier	Serial number
QNA-PT	0354648003
Description	Version
	002P20

Shows information on the device.

Password	
<input type="checkbox"/> Enable password to read	<input type="checkbox"/> Enable password to write
Password	Password
Repeat password	Repeat password

Allows the password to be enabled or disabled to block both the reading and writing values and the configuration of the device.

Configuration	
Capture period (min.)	
10	
Primary voltage	Secondary voltage
1	1
Primary current	Secondary current
5	5
Nominal voltage (V)	Nominal frequency (Hz)
230	50
Nominal current (mA)	Nominal power (W)
5.000	3.450
Circuit	Connection
<input checked="" type="radio"/> Three-phase <input type="radio"/> Aron	<input type="radio"/> Triangle (3 threads) <input checked="" type="radio"/> Star (4 threads)

- **Capture period:** Configuration in minutes between records stored on the device.
- **Primary voltage:** Device primary voltage value.
- **Secondary voltage:** Device secondary voltage value.
- **Primary current:** Device primary current value.
- **Secondary current:** Device secondary current value.
- **Rated voltage:** Rated voltage of the equipment, with a 3-wire configuration the composite voltage should be programd and the single voltage on four wires. If the measurement is carried out through voltage transformers, the programd value must refer to the secondary.
- **Nominal frequency:** Nominal frequency of the device.
- **Nominal current:** Nominal value of the device.
- **Nominal power:** Nominal power value of the device.
- **Circuit:** Enables the type of circuit to which it is connected to carry out the measurement to be chosen, whether it is connected to a three-phase device or if it only uses two current connectors for the measurement (Aron).
- **Connection:** Enables the type of connection to which it is connected to carry out the measurement to be chosen, whether delta (connection between phases, without neutral) or star (3-phase connection and neutral)

Quality	
Measure point	Commentary
MEDIDA00	COMENTARIO000000
Overvoltage threshold (%)	Overvoltage hysteresis (%)
110	2
Sag threshold (%)	Sag hysteresis (%)
90	2
Interruption threshold (%)	Interruption hysteresis (%)
10	2
Minimum frequency (Hz)	Maximum frequency (Hz)
49	51

- **Measurement point:** Brief description of the measurement point where the QNA is situated
- **Comments:** Brief description of the measurement point.
- **Overvoltage threshold:** Serves to program the overvoltage percentage. Each semi-cycle with an rms value exceeding this value will be understood as over voltage.
- **Overvoltage hysteresis:** Overvoltage hysteresis is where the start-up voltage is different from the end voltage of overvoltage. An overvoltage will start when the voltage threshold value is exceeded and will finish when it is lower than the value defined by the difference between the threshold and the hysteresis.
- **Gap threshold:** Serves to program the gap detection. Each semi-cycle with an rms value not reaching this defined value will be understood as a gap.
- **Gap Hysteresis:** Will define a gap hysteresis so that the initial voltage is different to the end of gap voltage. A gap will start when the voltage does not exceed the threshold value and will finish when this is lower than the value defined by the sum of the threshold and the hysteresis.
- **Interruption threshold:** defined as power off (absence of voltage, interruption) the voltage drops below the value set.
- **Interruption hysteresis:** An interruption hysteresis is when the start-up voltage is different from the voltage interruption end. An interruption will begin when the voltage does not exceed the threshold value and ends when it exceeds the value defined by the sum of the threshold and hysteresis interruption.
- **Minimum frequency:** Minimum frequency configured from a device generated event.
- **Maximum frequency:** Maximum frequency configured from a device generated event.

1.53 RGU-10 / RGU-10 RA

1.53.1 Driver options

Options menu:



1.53.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

1.53.1.1.1 RGU-10

 A screenshot of the "RGU-10 configuration" dialog box. It has a blue title bar with a close button (X) in the top right corner. The dialog is divided into several sections:

- Device Information:** A table-like section showing "Peripheral number" as 33, "Model" as RGU-10, "Identifier" as RGU10, and "Version" as 1.5. There is also a "Description" label.
- Operating system frequency:** Two radio buttons for "50 Hz" (selected) and "60 Hz".
- Trigger coil output polarity:** Two radio buttons for "Standard" (selected) and "Positive".
- Trigger current (A):** A dropdown menu showing "0,1".
- Trigger delay (s):** A dropdown menu showing "20 ms".
- Configure prealarm:**
 - Prealarm threshold (%):** A dropdown menu showing "Disabled".
 - Activation delay (s):** A dropdown menu showing "0,75".
 - Prealarm relay output polarity:** Two radio buttons for "Standard" (selected) and "Positive".
 - Operating mode:** Two radio buttons for "Normal" and "Recoverable" (selected).

 At the bottom, there are two buttons: "Accept" with a green checkmark icon and "Cancel" with a red X icon.

Device Information	
Peripheral number 33	Model RGU-10
Identifier RGU10	Version 1.5
Description	

Shows general information.

Operating system frequency
<input checked="" type="radio"/> 50 Hz <input type="radio"/> 60 Hz

Configuration of the frequency of the operating system.

Trigger coil output polarity
<input checked="" type="radio"/> Standard <input type="radio"/> Positive

Configuration of the polarity of the trigger coil relay output, allowing one of the two possible options to be selected (standard or positive).

Trigger current (A)
0.1

Configuration of the channel trigger threshold. It will be possible to select one of the following values:

0.03 A	0.1 A	0.3 A
0.5 A	1 A	3 A
5 A	10 A	30 A

Trigger delay (s)
20 ms

Enables the trigger delay time from one of the following values to be selected:

Instantaneous	Selective	20 ms
100 ms	200 ms	300 ms
400 ms	500 ms	750 ms
1 s	3 s	5 s
10 s		

Configure prealarm	
Prealarm threshold (%)	Activation delay (s)
Disabled	0.75
Prealarm relay output polarity	Operating mode
<input checked="" type="radio"/> Standard <input type="radio"/> Positive	<input type="radio"/> Normal <input checked="" type="radio"/> Recoverable

It will be possible to configure the pre-alarm following parameters:

- *Pre-alarm threshold.* Where can % of the nominal current can be defined to activate the pre-alarm, this value will vary between 50 and 90%.
- *Delay time on activation.* Enable the time delay in activating the pre-alarm to be selected from among the following values:

0.02 s	0.10 s	0.20 s
0.30 s	0.40 s	0.50 s
0.75 s	1.00 s	3.00 s
5.00 s	10.00 s	

- *Polarity of the pre-alarm relay output.*
- *Pre-alarm operating mode.*

1.53.1.1.2RGU-10 RA

RGU-10 configuration

Device Information

Peripheral number: 36
Model: RGU-10 RA

Identifier: RGU10 RA
Version: 1.2

Description:

Operating system frequency: ☒ 50 Hz ☐ 60 Hz

Trigger current (A):

Trigger delay (s):

Reconnections

Times

Reconnection sequence by leakage:

Reconnection sequence by shortcircuit:

Cut element:

Latch output polarity

☒ Normally open ☐ Normally closed

Operating mode

☐ Automatic reconnection disabled ☒ Normal

Device Information

Peripheral number: 36
Model: RGU-10 RA

Identifier: RGU10 RA
Version: 1.2

Description:

Shows general information.

Operating system frequency

☒ 50 Hz ☐ 60 Hz

Configuration of the frequency of the operating system.

Trigger current (A)

Configuration of the channel trigger threshold. It will be possible to select one of the following values:

0.03 A	0.1 A	0.3 A
0.5 A	1 A	3 A
5 A	10 A	30 A

Trigger delay (s)

Enables the trigger delay time to be selected from one of the following values:

Instantaneous:	Selective	20 ms
100 ms	200 ms	300 ms

400 ms	500 ms	750 ms
1 s	3 s	5 s
10 s		

The 'Reconnections' dialog box has the following sections:

- Times:**
 - Reconnection sequence by leakage: 10 - 1' (10) - 60'
 - Reconnection sequence by shortcircuit: 2 - 3' (2) - 30'
 - Cut element: Shortcircuit
- Latch output polarity:**
 - ☒ Normally open
 - ☐ Normally closed
- Operating mode:**
 - ☐ Automatic reconnection disabled
 - ☒ Normal

It will be possible to set the following reconnection parameters:

- *Residual current device reconnection Sequence.* Enables one of the following values to be selected

No.reconnection	Sequence times	Reset time
6	8, 16, 30, 59, 115 and 224 seconds	15 minutes
30	20, 40 seconds and 5 minutes for the rest	15 minutes
8	30 seconds, 1, 2, 3, 4, 5, 6 and 7 minutes	15 minutes
6	10,20,30,60,130 and 600 seconds	5 minutes
6	2, 4 and 8 minutes for the rest	15 minutes
6	30 seconds, 1, 2, 3, 4, 8 and 16 minutes	15 minutes
10	1 minute interconnections	30 minutes
10	90 seconds interconnections	30 minutes
6	2, 4, 6, 6, 6 and 6 minutes	15 minutes
10	3 minutes interconnections	30 minutes
10	1 minute interconnections	60 minutes
10	90 seconds interconnections	60 minutes
6	8 seconds interconnections	15 minutes

The information shown will be xx – yy – zz, where xx corresponds to the number reconnection, yy to the sequence of time and zz to the reset time.

- *Circuit breaker reconnection.* Allows one of the following values to be selected.

No.reconnection	Sequence times	Reset time
Reclosure disabled		
2	1 minute interconnections	30 minutes
2	1 minute interconnections	60 minutes
2	90 seconds interconnections	30 minutes
2	90 seconds interconnections	60 minutes
2	3 minutes interconnections	30 minutes
2	30 seconds interconnections	30 minutes
6	30 seconds interconnections	30 minutes

The information shown will be xx – yy – zz where xx corresponds to the number reconnection, yy to the sequence of time and zz to the reset time.

- *Cut-off element.* Lets the type of cut off element be selected from one of the following values:

Switch
Circuit breaker
Circuit breaker + trigger coil

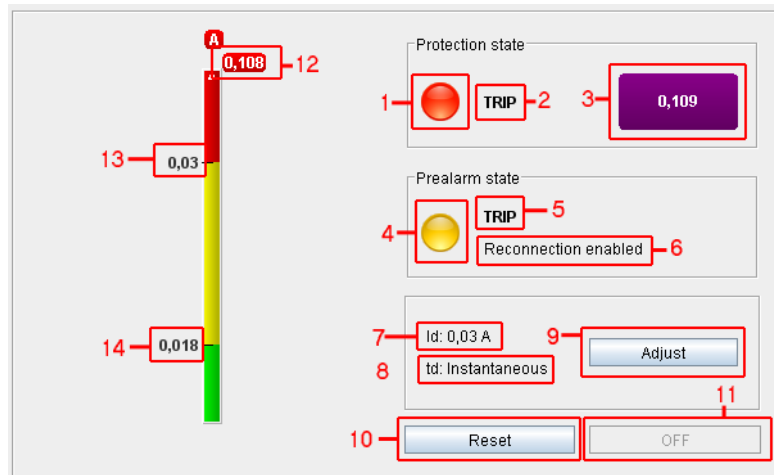
- *Polarity of the locking relay output.*

- Operation mode.

1.53.2 Displaying values

1.53.2.1 RGU-10

The RGU-10 device will show the following screen values:

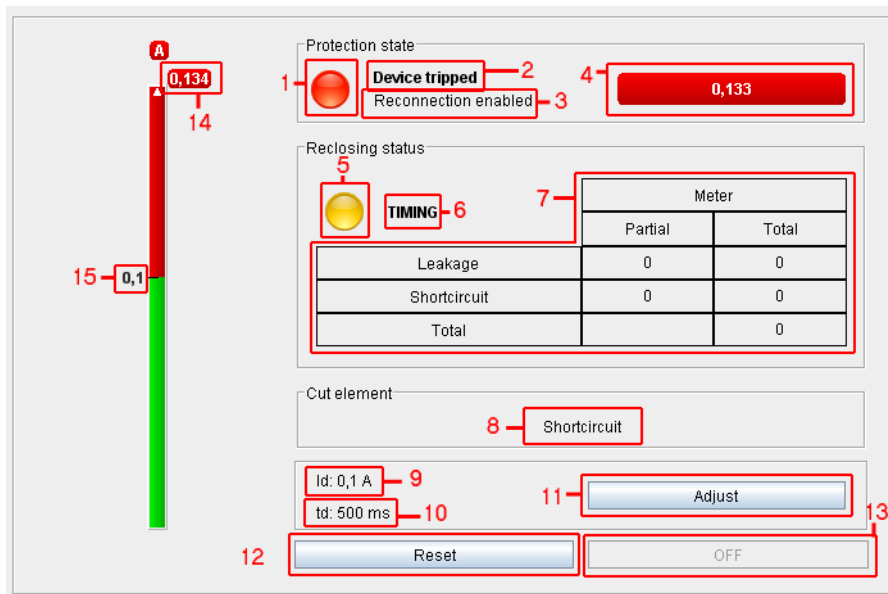


Where:

- Protection status:
 - ◆ ● Not tripped
 - ◆ ● Tripped.
- Additional information on the protection status.
- Differential current value detected in the channel trigger. This information will only be visible when the channel is tripped.
- Pre-alarm status:
 - ◆ ● Disabled
 - ◆ ● Pre-alarm enabled
- Additional information on the status of the pre-alarm.
- Additional information on the pre-alarm reconnection. This will only appear when automatic reconnection of the pre-alarm is enabled.
- Information about the configured trigger current threshold
- Information about the configured trigger time.
- Adjustment button. Displays channel information and allows some parameters to be modified.
- Reset button. If the channel is not triggered, the button will remain disabled. Push the button to restart the channel.
- OFF button. Enables remote triggering of the channel to be made. If the channel is tripped the button will remain disabled.
- Instantaneous differential current value. If the value exceeds the limits of the values bar, both over or under, an arrow below the value will indicate this.
- Trigger threshold value configured for the channel
- Pre-alarm value configured for the channel.

1.53.2.1.2 RGU-10 RA

The RGU-10 RA device will show the following value screen:



Where:

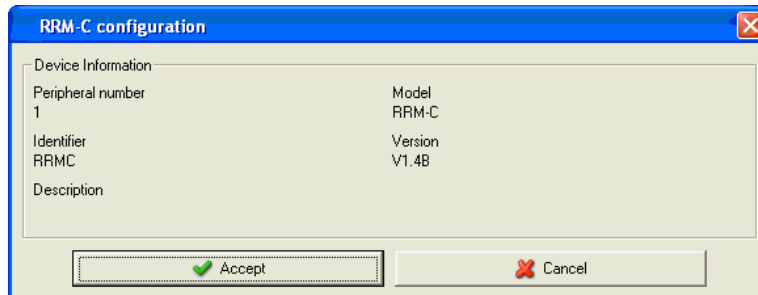
1. Protection status:
 - ◆ ● Not tripped
 - ◆ ● Tripped.
2. Additional information on the protection status.
3. Information that appears only when the reconnection is enabled
4. Differential current value detected in the channel trigger. This information will be visible only when the channel is tripped.
5. Reclosing status or channel locking indicator
 - ◆ ● Normal
 - ◆ ● ←→ . ● Blinking. The device is timing the reconnection
 - ◆ ● Fixed. The channel is locked.
6. Additional information on the interlocking status.
7. Table with the partial and total counter values.
8. Cut-off Element configured.
9. Information about the configured trigger current threshold
10. Information about the configured trigger time.
11. Adjustment button. Displays channel information and allows some parameters to be modified.
12. Reset button. If the channel is not triggered, the button will remain disabled. Push the button to restart the channel.
13. Off button. Enables remote triggering of the channel to be made. If the channel is tripped the button will remain disabled.
14. Instantaneous differential current value. If the value exceeds the limits of the values bar, both over or under, an arrow below the value will indicate this).
15. Trigger threshold value configured for the channel

1.54 RRM-C

This device does not keep a log, so it will not be possible to make graphs or tables of any parameter shown by the device.

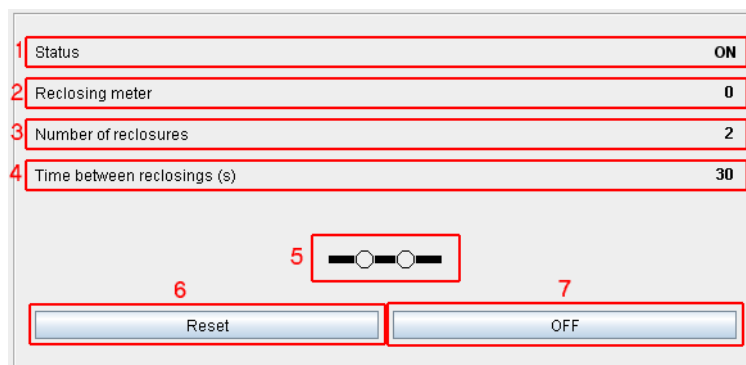
1.54.1 Driver options

Click on the "Options" buttons and information such as the model and the version of the device will be shown.



1.54.2 Displaying values

The RRM-C device will show the following value screen:



Where:

1. Displays the status of the device.
2. Shows the number of actual reconnections.
3. Number of reconnections configured on the device.
4. Time between reconnections configured on the device.
5. State of the device relay.



6. *Reset* button. Clicking the button resets the device.
7. *OFF* button. Clicking the button triggers the device.

1.55 R-440

The driver of the R-440 is peculiar in that it can access the variable of the machines connected to it, as well as its own flow variables, counters, digital inputs and outputs.

1.55.1 Configuration of an R-440 device

Use the devices menu to add a new R-440 device as a first level device.



The image shows a 'New R 440' configuration dialog box. It has a blue title bar with a close button. The form contains the following fields and options:

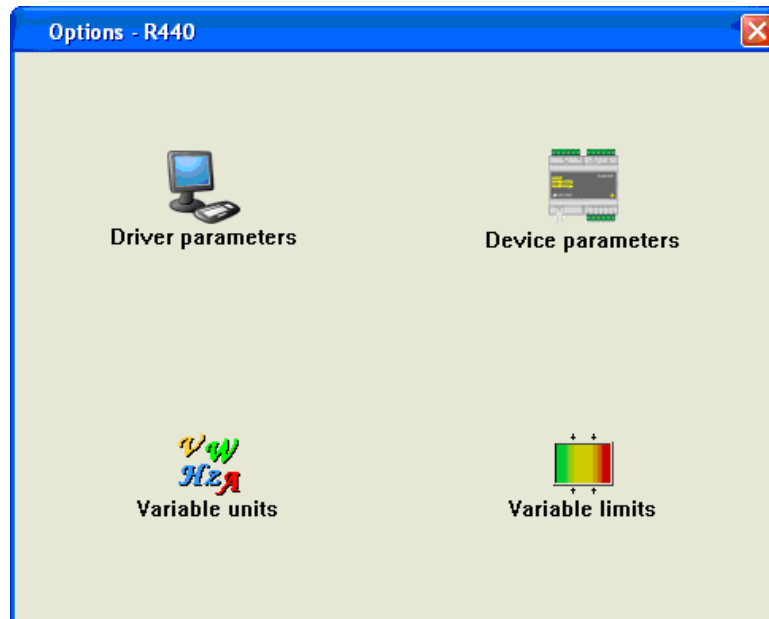
- Name:** A text box containing 'R-440'.
- Description:** An empty text box.
- Download variables of all devices:** An unchecked checkbox.
- Server:** A text box containing '192.168.5.101'.
- Port:** A text box containing '80'.
- User name:** An empty text box.
- Password:** An empty text box.
- Anonymous user:** An unchecked checkbox.
- Buttons:** 'Accept' (with a green checkmark icon) and 'Cancel' (with a red X icon).

As shown in the previous dialogue, the address and port of the R-440 equipment to which we want to connect must be indicated, and also the user and password if authentication is enabled.

The 'Download variables from all the machines' option may be chosen, in which case all machines and variables accessible in R-440 device will automatically be downloaded. If this option is not set, each variable must be added manually.

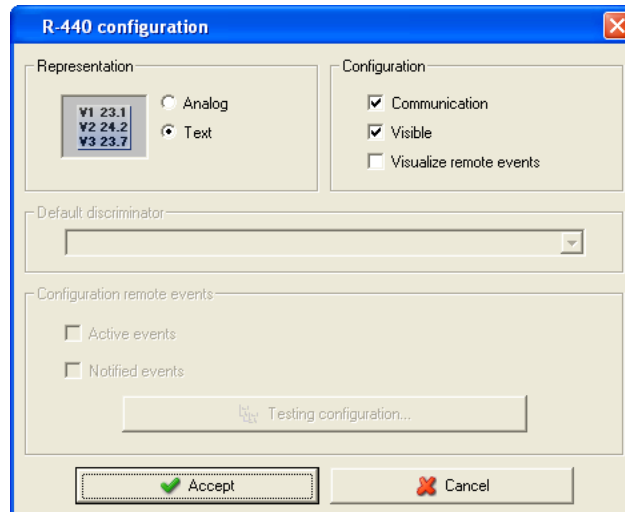
1.55.2 Driver options

Options menu:



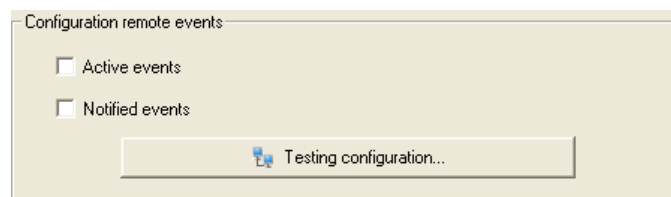
The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.55.2.1 Driver Parameters



☐ Visualize remote events

Allows the display of remote events in the client to be activated.



On activating the display of remote events the configuration of remote events will be enabled; here you can activate the types of events you want to receive and you can test communication with the remote equipment. These events can be displayed on the client in the same way as local events.

The remaining screen parameters are detailed in section 1.1.1 Driver parameters.

1.55.2.2 Device parameters

This screen is used to configure the variables that must be requested from the R-440 relating to the machines connected to it. In this case variable 'Counter1' of device 'LM4' has been selected.

R 440 configuration

Device Information

Identifier	Description
R440	

Date/time

Primary NTP server

Secondary NTP server

Synchronise clock

Variables

Identifier	Name

Identifier:
Name:
Variable:
Description:
Type:
Format:
Units:
Agrupation criteria:
Save:

+ Add ✎ Modify ✖ Delete

📁 Import configuration 📁 Export configuration

✔ Accept ✖ Cancel

Device Information

Identifier	Description
R440	

General R-440 device

information

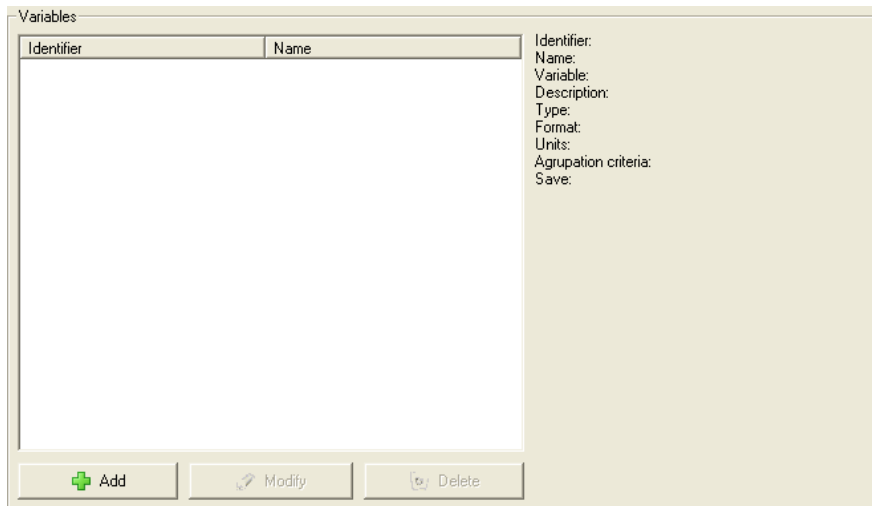
Date/time

Primary NTP server

Secondary NTP server

Synchronise clock

Possibility of sending the time and date from the PC to the R-440 device or configure an NTP server so that the device itself sets its time through the server.



Configuration of the variables added to the R-440 device.



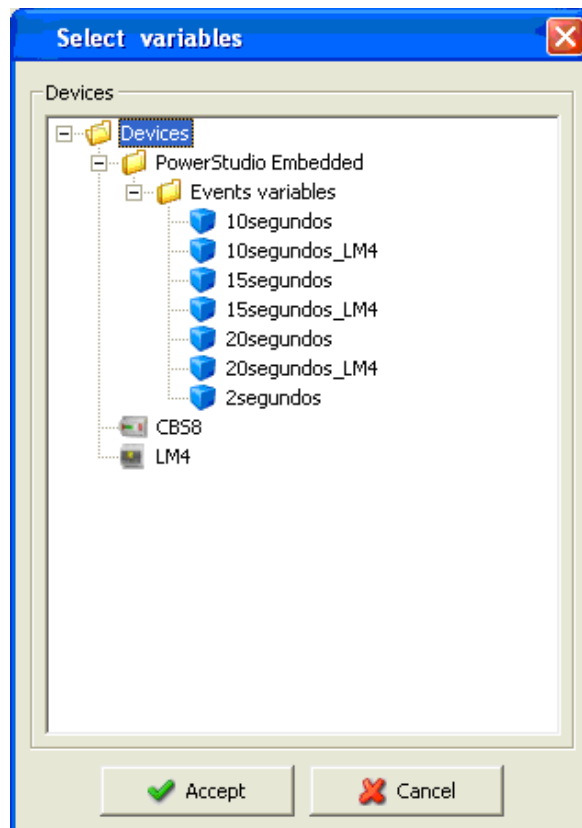
Allows loading of a variable configuration that was previously saved to disk. This option is useful when the same variables have to be configured on several R-440 devices.



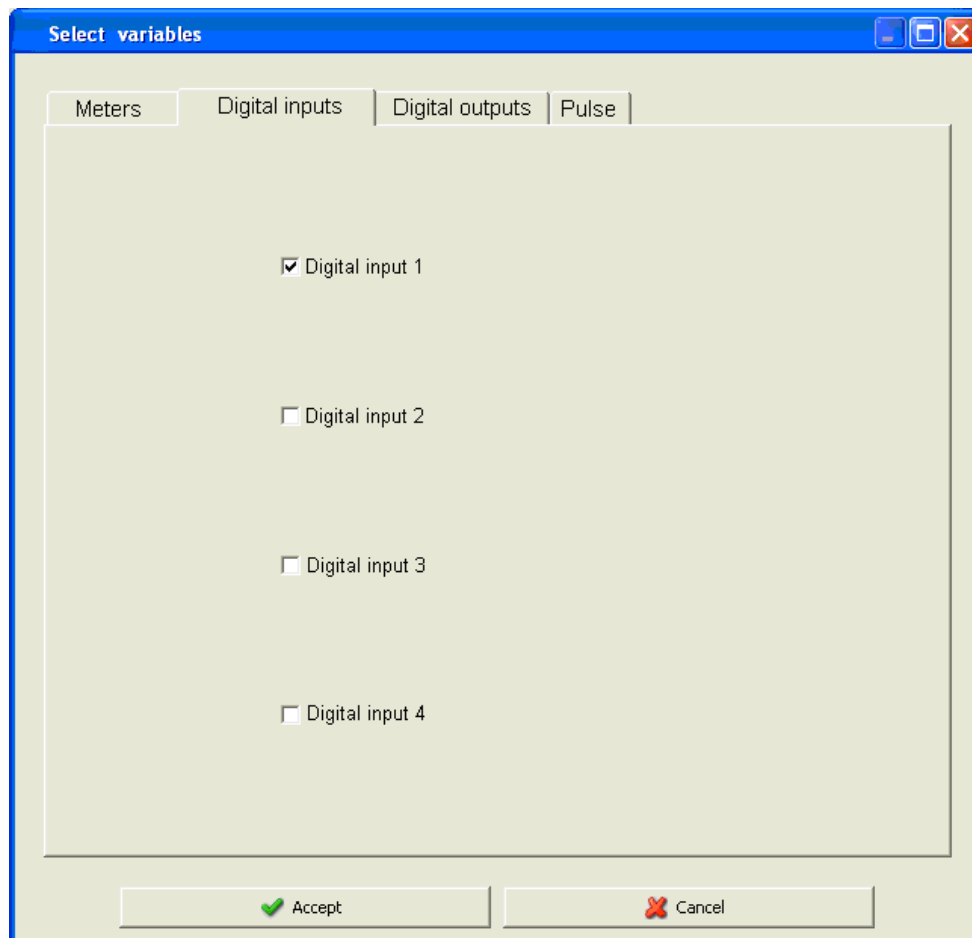
Allows the variable configuration to be saved to disk, so that it can subsequently be loaded on another R-440 device.

1.55.2.2.1 Variables

When the 'Add' button is pressed a selection tree of the R-440 devices will appear. When a device is selected, its variables selection screen will appear to select the variables to be added.



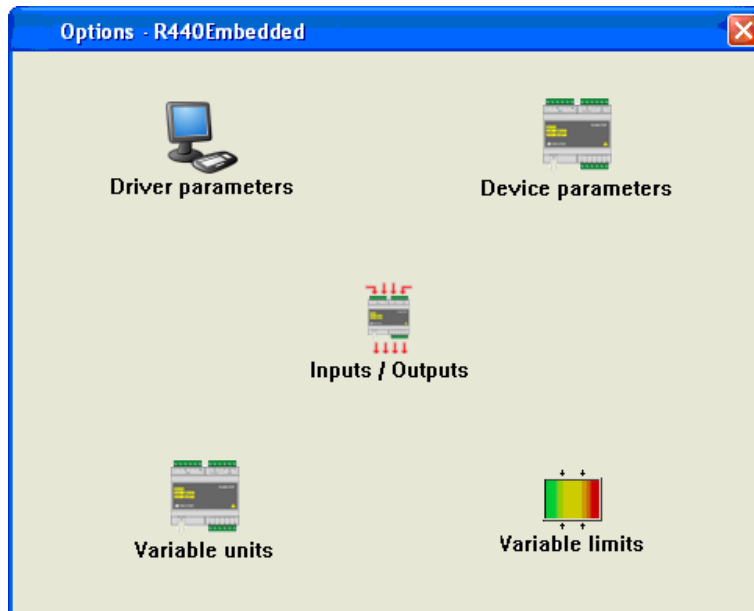
As an example of the variable selection screen we have that of an 'LM4' where we can see that the 'Digital input 1' variable has been selected.



1.56 R-440 Embedded¹⁰

1.56.1 Driver options

Options menu:

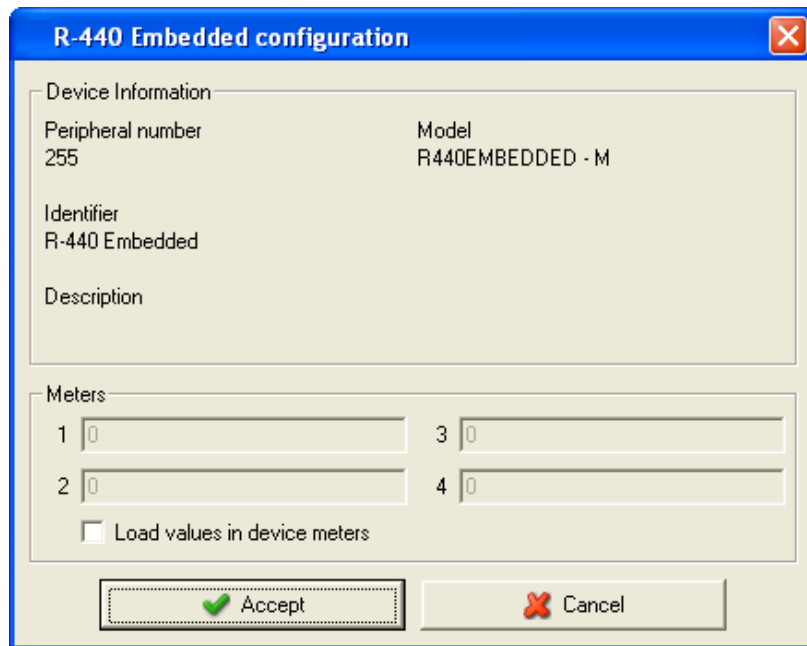


The '*Variable units*' and '*Variable limits*' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.56.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on '*Accept*' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

¹⁰ Valid only in applications running inside R440



R-440 Embedded configuration

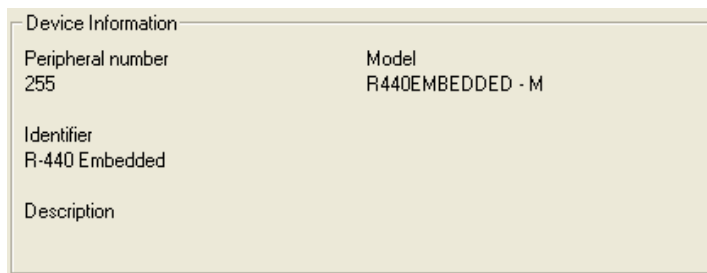
Device Information

Peripheral number	Model
255	R440EMBEDDED - M
Identifier	
R-440 Embedded	
Description	

Meters

1	<input type="text" value="0"/>	3	<input type="text" value="0"/>
2	<input type="text" value="0"/>	4	<input type="text" value="0"/>

☐ Load values in device meters

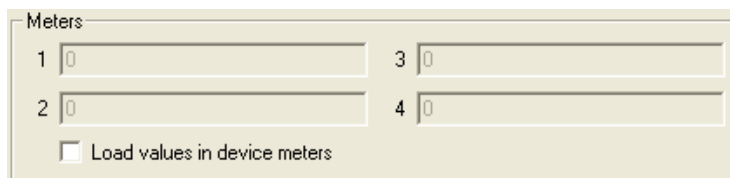


Device Information

Peripheral number	Model
255	R440EMBEDDED - M
Identifier	
R-440 Embedded	
Description	

General R-440 Embedded device

information



Meters

1	<input type="text" value="0"/>	3	<input type="text" value="0"/>
2	<input type="text" value="0"/>	4	<input type="text" value="0"/>

☐ Load values in device meters

It is possible to load a value into

device's counters.

1.56.1.2 Inputs/Outputs

	Description	Unit	Factor
1			1
2			1
3			1
4			1

Accept Cancel

By means of Meters Flow Digital inputs Digital outputs one can switch between the flow, digital inputs and outputs configurations of the counters. The previous image shows the configuration of the counters.

For each of the four counters it is possible to configure the following information:

- **Description:** Alphanumeric type data to identify the counter on the device display.
- **Unit:** Alphanumeric type datum to identify the counter units.
- **Factor:** Multiplier value which can be read on the counter.

The configuration of the flows will look as follows:

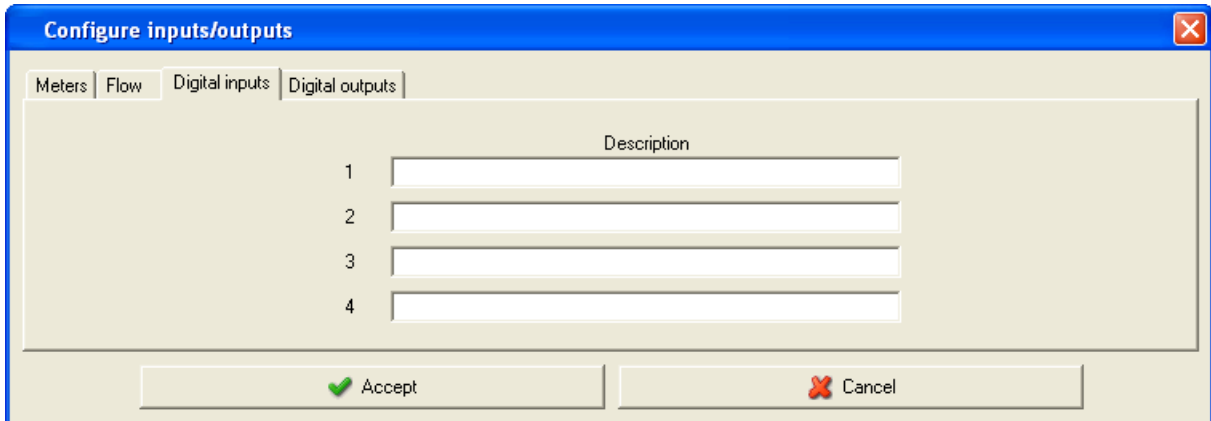
	Description	Unit	Factor	Time (min)	Calculation window (s)
<input checked="" type="checkbox"/> 1			1	1	30
<input checked="" type="checkbox"/> 2			1	1	30
<input type="checkbox"/> 3			1	1	30
<input type="checkbox"/> 4			1	1	30

Accept Cancel

Checking the selector ☒ will activate the flow variable. Remember if the selector is not checked it will not be possible to view the flow value of the related R-440 Embedded input.

- **Description:** Alphanumeric type data which permits a brief description of the flow to be entered for better identification.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the flow is shown to be entered.
- **Factor:** Multiplier value of each input pulse.
- **Time:** Time in minutes for calculating the flow value.
- **Calculation window:** Time window, in seconds, that the software will use to calculate an estimate of the flow, taking into account the value of the device counter.

The configuration of the digital inputs is as follows:

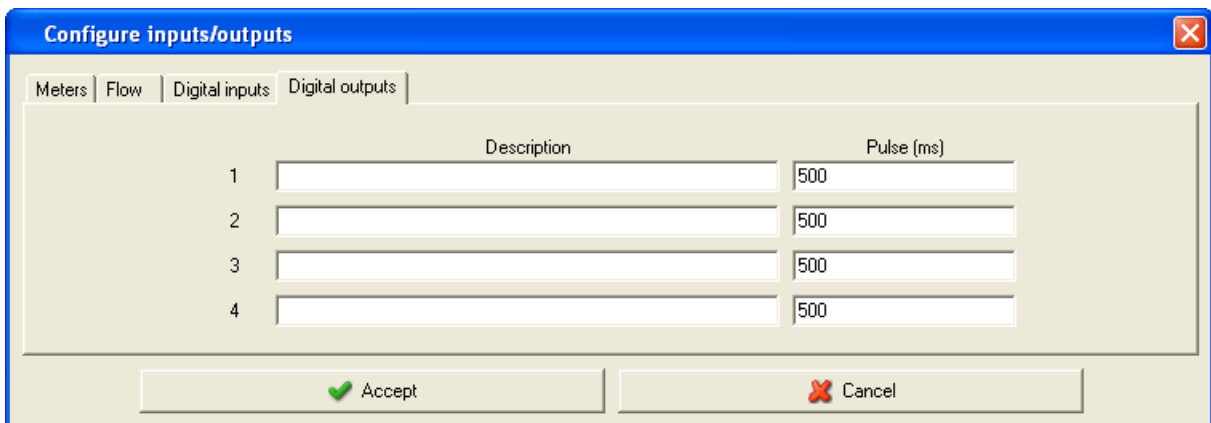


	Description
1	
2	
3	
4	

Accept Cancel

- **Description:** Alphanumeric type data which permits a brief description of the digital input to be entered for better identification.

Finally, the configuration of the digital outputs is as follows:



	Description	Pulse (ms)
1		500
2		500
3		500
4		500

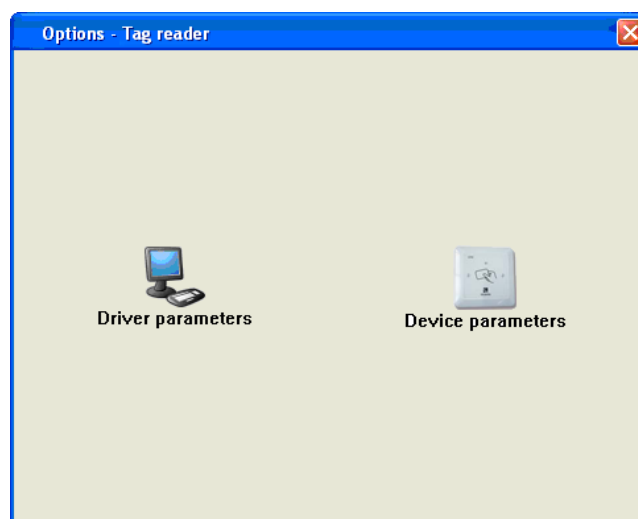
Accept Cancel

- **Description:** Alphanumeric type data which permits a brief description of the digital output to be entered for better identification.
- **Pulse:** Numeric data type which allows the opening of the digital output to be defined in milliseconds.

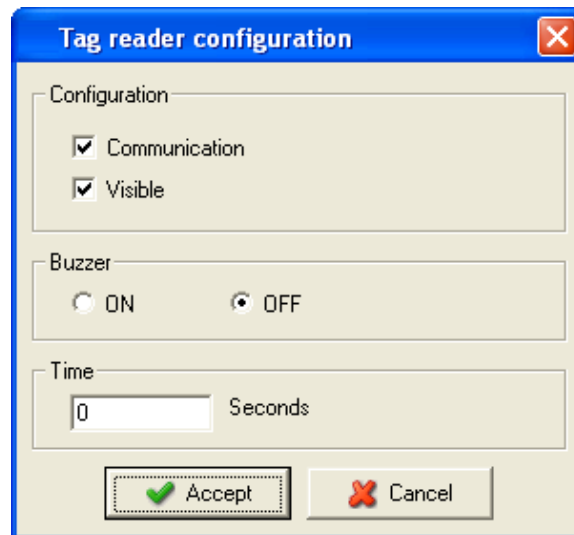
1.57 Tag Reader

1.57.1 Driver options

Options menu:



1.57.1.1 Driver Parameters



Tag reader configuration

Configuration

☒ Communication

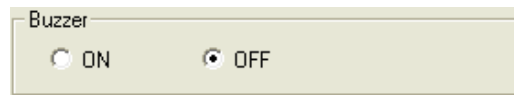
☒ Visible

Buzzer

☐ ON ☒ OFF

Time

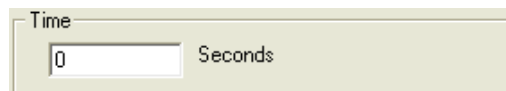
Seconds



Buzzer

☐ ON ☒ OFF

Activate or deactivate the device buzzer.



Time

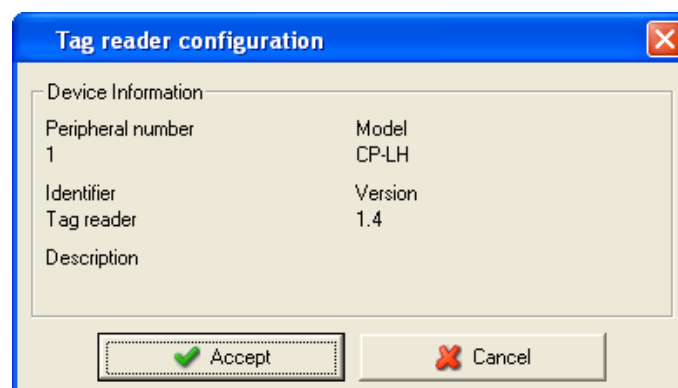
Seconds

Allows you to assign a time in seconds during which the value of the tag read will be kept before deleting.

The remaining screen parameters are detailed in section 1.1.1 Driver parameters.

1.57.1.2 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.



Tag reader configuration

Device Information

Peripheral number	Model
1	CP-LH
Identifier	Version
Tag reader	1.4
Description	

PowerStudio

Device Information	
Peripheral number	Model
1	CP-LH
Identifier	Version
Tag reader	1.4
Description	

Displays general information about the device.

1.58 TCP2RS Plus

The TCP2RS Plus converter connects equipment that works with a serial communication (RS-232/RS-485) to an Ethernet network using IP protocol.

When adding or modifying this device, see 'Editor Manual', the following dialogue box appears

Where

- **Name:** Alphanumeric field that uniquely identifies the device throughout the program. There are no two devices in the configuration with the same name.
- **Description:** Enter a brief description of the device using alphanumeric type data.
- **Converter address:** Corresponds to the address the program uses to communicate with the device. This parameter can be an IP address or a name. This address should not be confused with the MAC address.
- **Connection:** Indicates whether the connection is UDP, TCP or MODBUS-TCP.
- **Port:** Corresponds to the communications port.
- **Configuration port:** Corresponds to the communication port the program uses to configure the device. This port is 80 by default.

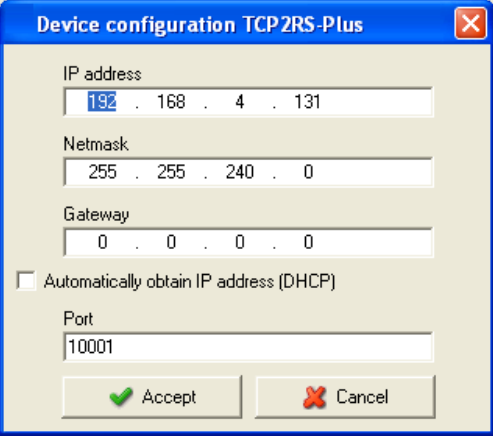


For a TCP2RS Plus device to communicate via a router the following steps must be followed:

- 1 - In the 'Address converter' field enter the router's IP address.
- 2 - In the 'Port' field enter the communications port and redirect this port on the router to the device's communications port.
- 3 - Redirect the configuration port on the router to port 80 of the converter.

NOTE: For information on readdressing ports consult the router user manual.

- **Parameters:** By clicking the button a dialogue box will appear where a number of parameters of the device can be configured.



Device configuration TCP2RS-Plus

IP address
192 . 168 . 4 . 131

Netmask
255 . 255 . 240 . 0

Gateway
0 . 0 . 0 . 0

☐ Automatically obtain IP address (DHCP)

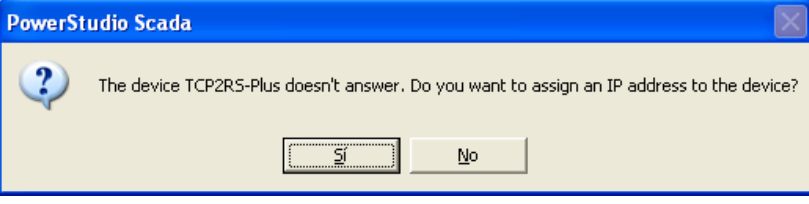
Port
10001

Accept Cancel

Where:

- *IP address*: Corresponds to the IP address used to communicate with the device.
 - *Subnetwork mask*: Corresponds to the subnetwork mask used on the network where the device is connected
 - *Predetermined Gateway*: Corresponds to the address of the gateway if the device is not on the same network as the PC containing the program.
 - *Obtain an IP address automatically (DHCP)*: This option will be enabled when we want the device to automatically receive the IP address via a DHCP server.
 - *Port*: Corresponds to the device communications port.
- **Advanced configuration**: Permits the configuration of a series of additional parameters on the device. Refer to 'Editor manual'.

On adding or modifying the device, the software will try to detect it. If it is unable to detect it, if the device is new or has not been allocated an IP address or has an allocated IP different to that entered in the 'Converter Address', it will ask if you want to assign a new IP address to the converter.



PowerStudio Scada

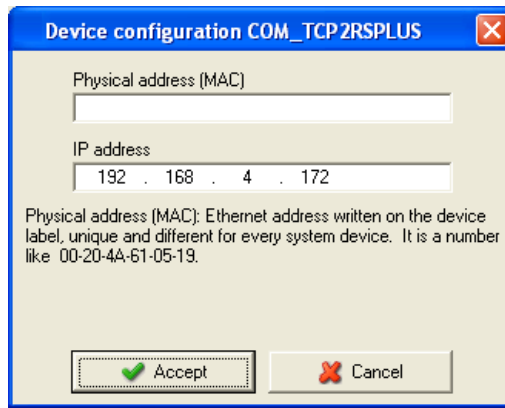
The device TCP2RS-Plus doesn't answer. Do you want to assign an IP address to the device?

Yes No



It will only be possible to assign an IP address to the device if it is on the same network as the computer running the program.

If the answer is 'Yes', the following dialogue box will appear, which will permit an IP address to be assigned to the device.



Device configuration COM_TCP2RSPLUS

Physical address (MAC)

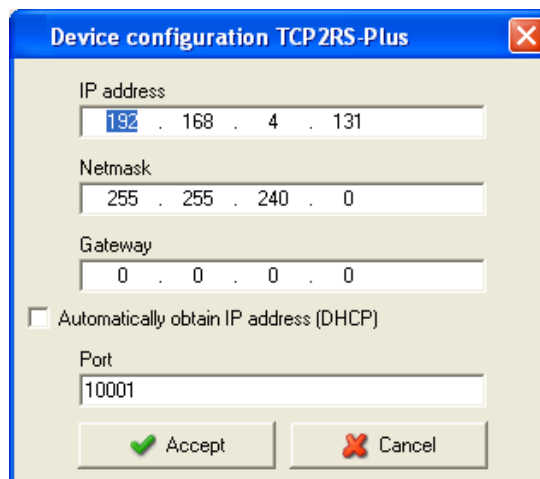
IP address

Physical address (MAC): Ethernet address written on the device label, unique and different for every system device. It is a number like 00-20-4A-61-05-19.

Where:

- **Physical address (MAC):** Ethernet address that each device has, which is unique and distinct on all network devices. The hardware address that any network interface has. Will be of the type 00-20-4A-61-05-19.
- **IP address:** IP Address to be allocated to the device that has the physical address introduced in the previous field.

If it is possible to assign an IP address to the converter, the following dialogue box will appear:



Device configuration TCP2RS-Plus

IP address

Netmask

Gateway

☐ Automatically obtain IP address (DHCP)

Port

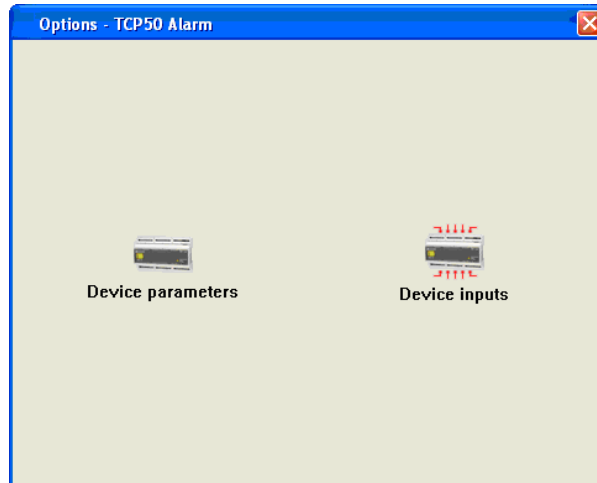
To finish setting up the rest of the parameters for communication with the device.

1.59 TCP50 – ALARM

This device does not keep a log; therefore it is not possible to configure any device parameters.

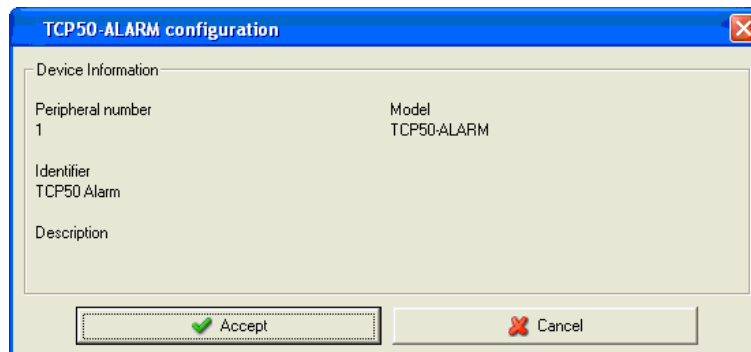
1.59.1 Driver options

Options menu:



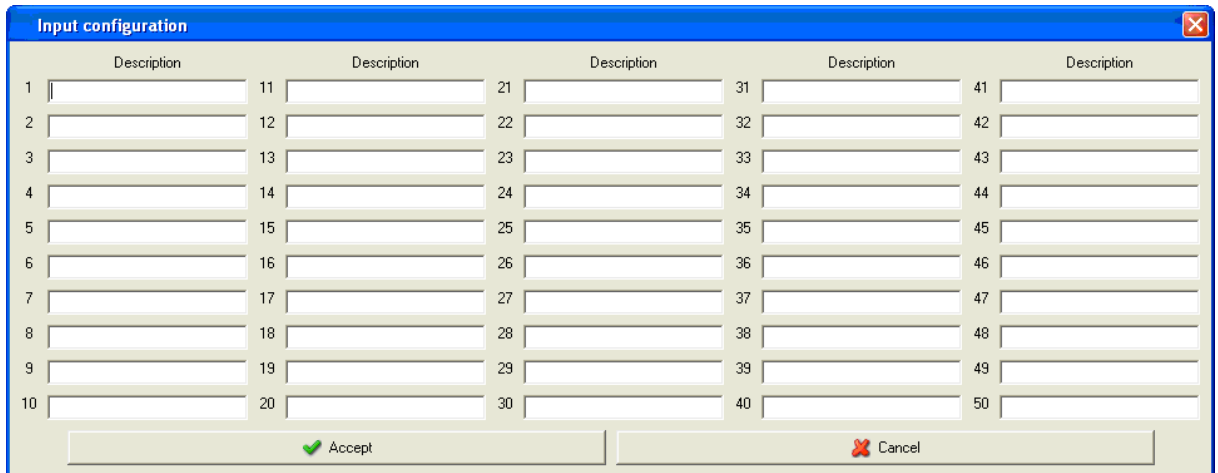
1.59.1.1 Device parameters

Click on the "Device Parameters" button and information will be shown about the device.



1.59.1.2 Device inputs



















































By means of this dialogue box a brief description of the device inputs can be entered for improved identification purposes.



The 'Input configuration' dialog box features a table with 50 rows and 5 columns, each column labeled 'Description'. The rows are numbered 1 to 50. At the bottom, there are 'Accept' and 'Cancel' buttons.

Description	Description	Description	Description	Description
1		11		21
2		12		22
3		13		23
4		14		24
5		15		25
6		16		26
7		17		27
8		18		28
9		19		29
10		20		30
				31
				32
				33
				34
				35
				36
				37
				38
				39
				40
				41
				42
				43
				44
				45
				46
				47
				48
				49
				50

1.59.2 Viewing values

Digital inputs			
Digital input 1	1	Closed	
Digital input 2	2	Closed	
Digital input 3	3	Closed	
Digital input 4		Closed	
Digital input 5		Closed	
Digital input 6		Closed	
Digital input 7		Closed	
Digital input 8		Closed	
Digital input 9		Opened	
Digital input 10		Closed	
Digital input 11		Closed	
Digital input 12		Closed	
Digital input 13		Closed	
Digital input 14		Closed	
Digital input 15		Closed	
Digital input 16		Closed	
Digital input 17		Closed	
Digital input 18		Closed	
Digital input 19		Closed	
Digital input 20		Closed	
Digital input 21		Closed	
Digital input 22		Closed	
Digital input 23		Closed	
Digital input 24		Closed	
Digital input 25		Closed	
Digital input 26		Opened	
Digital input 27		Opened	
Digital input 28		Opened	
Digital input 29		Opened	
Digital input 30		Opened	
Digital input 31		Opened	
Digital input 32		Opened	
Digital input 33		Opened	
Digital input 34		Opened	
Digital input 35		Opened	
Digital input 36		Opened	
Digital input 37		Opened	
Digital input 38		Opened	
Digital input 39		Opened	
Digital input 40		Opened	
Digital input 41		Opened	
Digital input 42		Opened	
Digital input 43		Opened	
Digital input 44		Opened	
Digital input 45		Opened	
Digital input 46		Opened	
Digital input 47		Opened	
Digital input 48		Opened	
Digital input 49		Opened	
Digital input 50		Opened	

1 Digital input number. Specifies the digital input in use.

2 Input status

Input Open
Input Closed

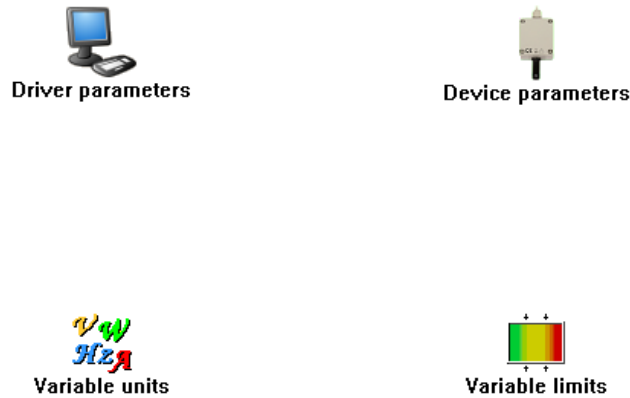
3 Input status

 Open
 Closed

1.60 TH-DG-RS485

1.60.1 Driver options

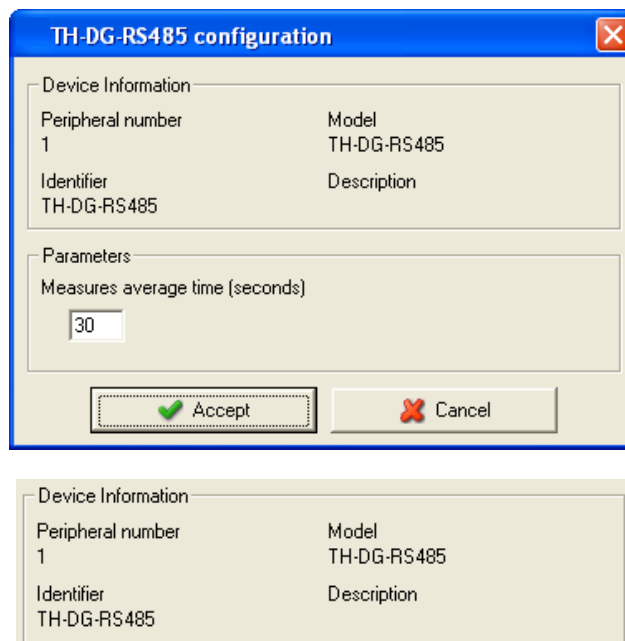
Options menu:



The 'Variable units' and 'Variable limits' options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

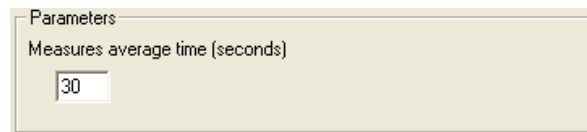
1.60.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.



Displays general information.

PowerStudio



The screenshot shows a 'Parameters' dialog box with a title bar. Inside, the text 'Measures average time (seconds)' is displayed above a text input field. The input field contains the number '30'.

Allows the average measurement recording time to be entered. The TH-DG-RS485 device measures the temperature and humidity and calculates the average. Each time the period indicated in this screen has elapsed, it will record the value obtained.

1.61 TR8

This device may be configured as master or slave, and up to 31 slave devices can be connected to a master device. At the time the slave devices are connected to the master, 30 seconds will be required to detect all the devices. If PowerStudio is started during this time, the values of the devices that have not yet been detected will not be monitored.

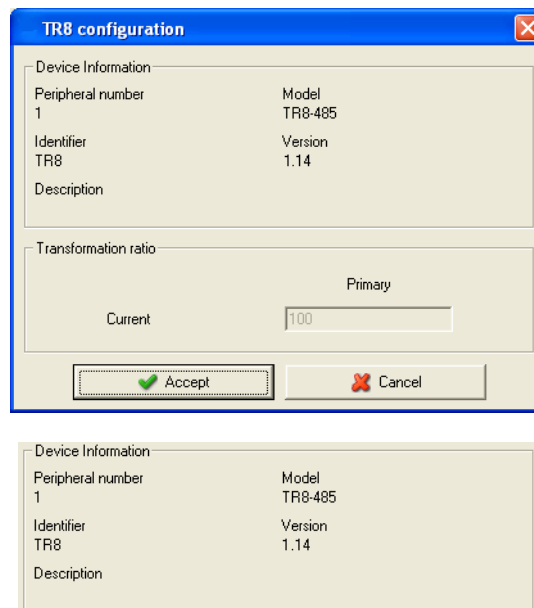
1.61.1 Driver options

Options menu:



1.61.1.1 Device parameters

This screen allows some of the internal parameters of the device to be viewed, and it is not possible to change any of the configuration parameters. In no case will the information be stored on the hard drive of the PC.



Shows information on the device.

PowerStudio

Transformation ratio	
	Primary
Current	<input type="text" value="100"/>

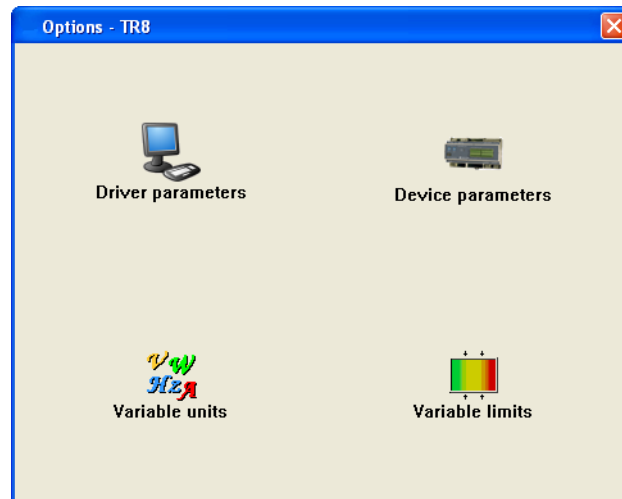
- **Primary current:** Device primary current value.

1.62 TR16

This device may be configured as master or slave, and up to 31 slave devices can be connected to a master device. At the time the slave devices are connected to the master, 30 seconds will be required to detect all the devices. If PowerStudio is started during this time, the values of the devices that have not yet been detected will not be monitored.

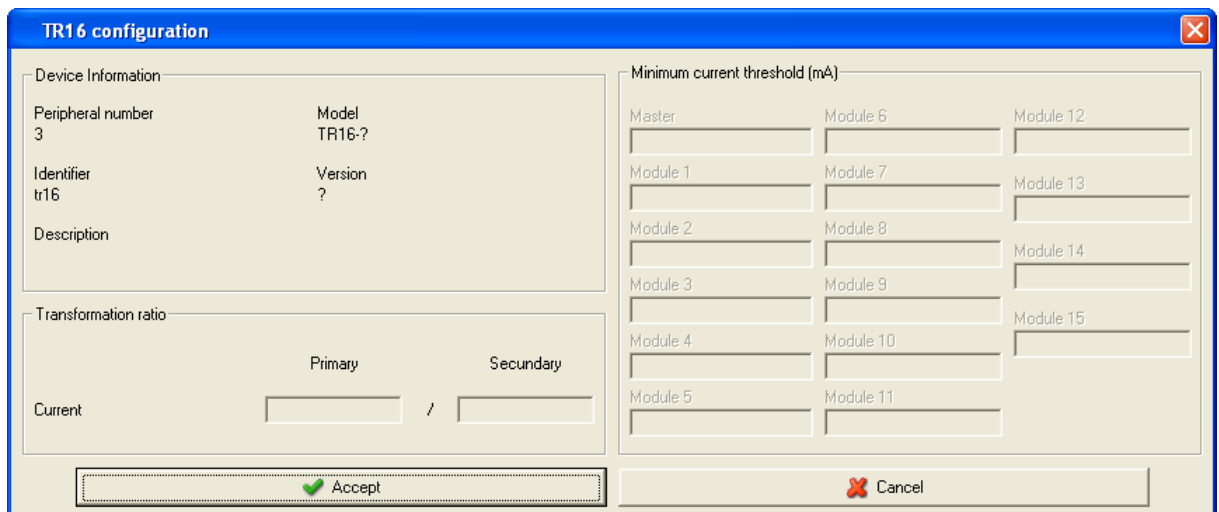
1.62.1 Driver options

Options menu:



1.62.1.1 Device parameters

This screen allows some of the internal parameters of the device to be viewed, and it is not possible to change any of the configuration parameters. In no case will the information be stored on the hard drive of the PC.



PowerStudio

Device Information	
Peripheral number	Model
3	TR16-?
Identifier	Version
tr16	?
Description	

Shows information on the device.

Transformation ratio	
	Primary Secondary
Current	<input type="text"/> / <input type="text"/>

- **Primary:** Device primary current value.
- **Secondary:** Device secondary current value.

Both provide information on the transformation ratio.

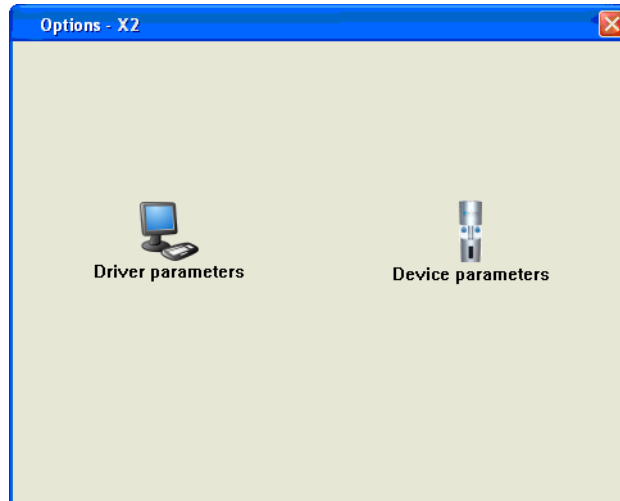
Minimum current threshold (mA)		
Master	Module 6	Module 12
<input type="text"/>	<input type="text"/>	<input type="text"/>
Module 1	Module 7	Module 13
<input type="text"/>	<input type="text"/>	<input type="text"/>
Module 2	Module 8	Module 14
<input type="text"/>	<input type="text"/>	<input type="text"/>
Module 3	Module 9	Module 15
<input type="text"/>	<input type="text"/>	<input type="text"/>
Module 4	Module 10	
<input type="text"/>	<input type="text"/>	
Module 5	Module 11	
<input type="text"/>	<input type="text"/>	

Enables definition of the current threshold (starting point on the scale) for the different modules.

1.63 X2

1.63.1 Driver options

Options menu:



1.63.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

Device Information	
Peripheral number 168	Model X2
Identifier X2	Version 4.09
Description	

Euros/kWh	
Plug 1 999.999999	Plug 2 999.999999

General	
Euros of credit 4	
Charge time limit for each plug (min) 120	
Reset time limit for the cycle by forgetting open top (s) 120	

Operating mode	
1	OFF ON 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
2	OFF ON 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3	OFF ON 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
4	OFF ON 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
5	OFF ON 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
6	OFF ON 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

Accept Cancel

Some of these options will not be available depending on the version of the X2 device.

PowerStudio

Device Information	
Peripheral number	Model
168	X2
Identifier	Version
X2	4.09
Description	

Displays general information about the device.

Euros/kWh	
Plug 1	Plug 2
999.999999	999.999999

Value of the kWh which will be charged for the recharging. Allows you to enter a different price for each plug.

General	
Euros of credit	
4	
Charge time limit for each plug (min)	
120	
Reset time limit for the cycle by forgetting open top (s)	
120	

- **Euros of credit:** Credit in Euros that the X2 device will subtract from the card's credit on starting recharging. On completing recharging, the X3 device will be responsible for returning the credit not consumed. This parameter is common to both plugs.
- **Charge time limit for each plug (min):** Maximum charge time. This parameter is common to both plugs.
- **Reset time limit for the cycle by forgetting open cover(s):** Whole value in seconds.

Operating mode	
1	OFF
	ON
	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

Operating mode 1:

- **Bit 0:** Paid or free service.
 - 0 = Paid
 - 1 = Free
- **Bit 1:** Charge time limit.
 - 0 = Without
 - 1 = With
- **Bit 2:** Credits.
 - 0 = Credit units
 - 1 = All credit available
- **Bit 3:** "Anti-theft" meter system, Plug 1 and 2.
 - 0 = YES
 - 1 = NO
- **Bit 4:** Continue cycle after a "Power Fail".
 - 0 = NO
 - 1 = YES
- **Bit 5:** Plug 1. Functionality.
 - 0 = Normal operation
 - 1 = Without service
- **Bit 6:** Plug 2. Functionality.
 - 0 = Normal operation
 - 1 = Without service
- **Bit 7:** Kw cost.
 - 0 = On card
 - 1 = On equipment
- **Bit 8:** "Anti-theft" meter system, Plug 2.

- 0 = YES
 - **Bit 9:** Reversal of the display digits.
 - 0 = left -> Ch1, right -> Ch2
 - **Bit 10:** Enable input for external meter.
 - 0 = NO
 - **Bit 15:** Current measurement.
 - 0 = Multi-toroidal
- 1 = NO
- 1 = left -> Ch2, right -> Ch1
- 1 = YES
- 1 = Mono-toroidal

2 Appendices

2.1 Variables

In order to use references to the variables measured by devices in Scada, reports, charts and tables, it will be necessary to know the encoding used by the software for each of them.

The basic encoding comprises the device name and the variable code separated by a dot.

name.variable

In this way the software will know which variable is involved and which device to ask for its value.

This encoding (variable.name) can be used in formulae, graphs and tables, although in the case of reports, graphs and tables we can display variables saved in value log files.

On those occasions we wish to filter a variable, as long as the variable can be filtered, for instance in the case of energy, the filter information will be added to the basic encoding.

name_filter@name_type_time:name.variable

Here the name of the filter and the name of the type of hour upon which the variable values will be filtered are indicated.

This type of encoding with filters may only be used in reports, graphs and tables, and with variables that have been saved in value log files.

For a better understanding, the variables are displayed in separate tables depending on the type of variable measured by the devices. The columns on the left correspond to the type of variable measured: whether the variable is instantaneous, maximum or minimum, the phase to which it corresponds, or any other information depending on the variable, and finally the code used (for example the instantaneous phase-neutral voltage of phase 1 will correspond to the code VI1). On the other hand, the columns to the right of each table will correspond to devices that can measure each of the variables, indicating with an 'X' if the variable will be measured by the device and with an 'O' if the variable will be measured depending on the version of the device.

2.1.1 Voltage

	Phase – neutral voltage											
	Instantaneous				Maximum				Minimum			
	L1 VI1	L2 VI2	L3 VI3	III VI	L1 VMX1	L2 VMX2	L3 VMX3	III VMX	L1 VMN1	L2 VMN2	L3 VMN3	III VMN
CIRWATT	X	X	X									
CIRWATT B	X	X	X									
Computer Smart	X	X	X		X	X	X		X	X	X	
CVM 144	X	X	X		X	X	X		X	X	X	
CVM 96	X	X	X		X	X	X		X	X	X	
CVM B/BD	X	X	X	X								
CVM BC	X	X	X		X	X	X		X	X	X	
CVM K	X	X	X	X								
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVMK HAR	X	X	X									
CVM MINI	X	X	X		X	X	X		X	X	X	
CVM NET	X	X	X		X	X	X		X	X	X	
CVM NRG 96	X	X	X		X	X	X		X	X	X	
CVM SP	X				X				X			
CVM 1D				X				X				X
MK LCD	X				X							
MP3/MP4	X	X	X		X	X	X		X	X	X	
POWERNET	X	X	X		X	X	X		X	X	X	
QNA	O	O	O									

	Phase – phase voltage											
	Instantaneous				Maximum				Minimum			
	L1 VI12	L2 VI23	L3 VI31	III VI123	L1 VMX12	L2 VMX23	L3 VMX31	III VMX123	L1 VMN12	L2 VMN23	L3 VMN31	III VMN123
CIRWATT	X	X	X									
Computer Smart	X	X	X	X	X	X	X	X	X	X	X	X
CVM 144	X	X	X		X	X	X		X	X	X	
CVM 96	X	X	X		X	X	X		X	X	X	
CVM B/BD	X	X	X	X								
CVM BC	X	X	X		X	X	X		X	X	X	
CVM K	X	X	X	X								
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVMK HAR	X	X	X									
CVM MINI	X	X	X		X	X	X		X	X	X	
CVM NET	X	X	X		X	X	X		X	X	X	
CVM NRG 96	X	X	X		X	X	X		X	X	X	
MK LCD	X				X							
POWERNET	X	X	X		X	X	X		X	X	X	
QNA	O	O	O									

	Nominal voltage		
	Instantaneous		
	L1	L2	L3
	VPNOMI1	VPNOMI2	VPNOMI3
QNA	X	X	X

	Neutral voltage		
	Instantaneous	Maximum	Minimum
	VNI	VNMX	VNMN
CVM K2	X	X	X
QNA	O		

	Absolute minimum – voltage					
	All registers			Valid registers		
	L1	L2	L3	L1	L2	L3
	V1MINT	V2MINT	V3MINT	V1MINV	V2MINV	V3MINV
QNA	O	O	O	O	O	O

	Lower percentile [5%] – voltage					
	All registers			Valid registers		
	L1	L2	L3	L1	L2	L3
	V1INFT	V2INFT	V3INFT	V1INFV	V2INFV	V3INFV
QNA	O	O	O	O	O	O

PowerStudio

Higher percentile [95%] – voltage						
All registers				Valid registers		
L1	L2	L3		L1	L2	L3
V1SUPT	V2SUPT	V3SUPT		V1SUPV	V2SUPV	V3SUPV
QNA	0	0	0	0	0	0

Absolute maximum – Voltage						
All registers				Valid registers		
L1	L2	L3		L1	L2	L3
V1MAXT	V2MAXT	V3MAXT		V1MAXV	V2MAXV	V3MAXV
QNA	0	0	0	0	0	0

Voltage distortion									
Instantaneous			Maximum			Minimum			
L1	L2	L3	L1	L2	L3	L1	L2	L3	
DVI1	DVI2	DVI3	DVMX1	DVMX2	DVMX3	DVMN1	DVMN2	DVMN3	
CVM 144	X	X	X	X	X	X	X	X	X
CVM 96	X	X	X	X	X	X	X	X	X
CVM B/BD	0	0	0						
CVM BC	X	X	X	X	X	X	X	X	X
CVM K	0	0	0						
CVM K2	X	X	X	X	X	X	X	X	X
CVMK HAR	X	X	X						
CVM MINI	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X
CVM SP	X			X		X			
POWERNET	X	X	X	X	X	X	X	X	X
QNA	X	X	X						

Voltage distortion		
Instantaneous	Maximum	Minimum
DVI	DVMX	DVMN
Computer Smart	X	X

Voltage distortion on neutral		
Instantaneous	Maximum	Minimum
DVNI	DVNMX	DVNMN
CVM K2	X	X

Voltage distortion – Higher percentile [95%]								
All registers				Valid registers				
L1	L2	L3	III	L1	L2	L3	III	
DV1SUPT	DV2SUPT	DV3SUPT	DVSUPT	DV1SUPV	DV2SUPV	DV3SUPV	DVSUPV	
QNA	0	0	0	0	0	0	0	0

Phase – neutral voltage Net		
L1	L2	L3
VI1N	VI2N	VI3N
AFQ	X	X

2.1.2 Current

	Current											
	Instantaneous				Maximum				Minimum			
	L1 AI1	L2 AI2	L3 AI3	III AI	L1 AMX1	L2 AMX2	L3 AMX3	III AMX	L1 AMN1	L2 AMN2	L3 AMN3	III AMN
CIRWATT	X	X	X									
CIRWATT B	X	X	X									
CVM 144	X	X	X		X	X	X		X	X	X	
CVM 96	X	X	X		X	X	X		X	X	X	
CVM B/BD	X	X	X	X								
CVM BC	X	X	X		X	X	X		X	X	X	
CVM K	X	X	X	X								
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVMK HAR	X	X	X									
CVM MINI	X	X	X		X	X	X		X	X	X	
CVM NET	X	X	X		X	X	X		X	X	X	
CVM NRG 96	X	X	X		X	X	X		X	X	X	
CVM SP	X				X				X			
CVM 1D				X				X				X
MK LCD	X				X							
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
POWERNET	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Current		
	Instantaneous	Maximum	Minimum
	AI	AMX	AMN
Computer Smart	X	X	X

	Neutral current		
	Instantaneous	Maximum	Minimum
	ANI	ANMX	ANMN
CVM 144	O	O	O
CVM 96	O	O	O
CVM B/BD	O		
CVM BC	O	O	O
CVM K	O		
CVM K2	X	X	X
CVM MINI	X	X	X
CVM NET	X	X	X
CVM NRG 96	X	X	X
QNA	O		

	Diferential current		
	Instantaneous	Maximum	Minimum
	AELI	AELMX	AELMN
Computer Smart	X	X	X
CVM 144	O	O	O
MP3/MP4	X		

	Current distortion								
	Instantaneous			Maximum			Minimum		
	L1 DAI1	L2 DAI2	L3 DAI3	L1 DAMX1	L2 DAMX2	L3 DAMX3	L1 DAMN1	L2 DAMN2	L3 DAMN3
CVM 144	X	X	X	X	X	X	X	X	X
CVM 96	X	X	X	X	X	X	X	X	X
CVM B/BD	O	O	O						
CVM BC	X	X	X	X	X	X	X	X	X
CVM K	O	O	O						
CVM K2	X	X	X	X	X	X	X	X	X
CVMK HAR	X	X	X						
CVM MINI	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X
CVM SP	X			X			X		
POWERNET	X	X	X	X	X	X	X	X	X
QNA	O	O	O						

Current distortion on neutral			
Instantaneous		Maximum	Minimum
DANI		DANMX	DANMN
CVM K2	X	X	X

Current Net			Current Load		
L1	L2	L3	L1	L2	L3
AI1N	AI2N	AI3N	AI1L	AI2L	AI3L
AFQ	X	X	X	X	X

Current distortion Net			Current distortion Load		
L1	L2	L3	L1	L2	L3
DAI1N	DAI2N	DAI3N	DAI1L	DAI2L	DAI3L
AFQ	X	X	X	X	X

Current escale			
Instantaneous		Maximum	Minimum
ESCALEI		ESCALEMX	ESCALEMN
Computer Smart	X	X	X

Current distortion			
Instantaneous		Maximum	Minimum
DAI		DAMX	DAMN
Computer Smart	X	X	

2.1.3 Frequency

	Frequency		
	Instantaneous	Maximum	Minimum
	HZI	HZMX	HZMN
CIRWATT	X		
Computer Smart	X	X	X
CVM 144	X	X	X
CVM 96	X	X	X
CVM B/BD	X		
CVM BC	X	X	X
CVM K	X		
CVM K2	X	X	X
CVM K HAR	X		
CVM MINI	X	X	X
CVM NET	X	X	X
CVM NRG 96	X	X	X
CVM SP	X	X	X
MK LCD	X	X	
MP3/MP4	X	X	X
POWERNET	X	X	X
QNA	X		

	Absolute minimum – Frequency	
	All registers	Valid registers
	HZMINT	HZMINV
QNA	O	O

	Lower percentile [5%] – Frequency	
	All registers	Valid registers
	HZINFT	HZINFV
QNA	O	O

	Upper percentile [95%] – Frequency	
	All registers	Valid registers
	HZSUPT	HZSUPV
QNA	O	O

	Absolute maximum – Frequency	
	All registers	Valid registers
	HZMAXT	HZMAXV
QNA	O	O

	Net Frequency	
	HZIN	
	X	
AFQ		

2.1.4 Power

	Apparent power consumed											
	Instantaneous				Maximum				Minimum			
	L1 VAI1	L2 VAI2	L3 VAI3	III VAI	L1 VAMX1	L2 VAMX2	L3 VAMX3	III VAMX	L1 VAMN1	L2 VAMN2	L3 VAMN3	III VAMN
CIRWATT	X	X	X	X								
CIRWATT B	X	X	X	X								
Computer Smart				X				X				X
CVM 144	X	X	X	X	X	X	X	X	X	X	X	X
CVM 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM B/BD	X	X	X	X								
CVM BC	X	X	X	X	X	X	X	X	X	X	X	X
CVM K	X	X	X	X								
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM SP	X				X				X			
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
POWERNET				X				X				X
QNA				O								

	Apparent power generated											
	Instantaneous				Maximum				Minimum			
	L1 NVAI1	L2 NVAI2	L3 NVAI3	III NVAI	L1 NVAMX1	L2 NVAMX2	L3 NVAMX3	III NVAMX	L1 NVAMN1	L2 NVAMN2	L3 NVAMN3	III NVAMN
Computer Smart				X				X				X
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
QNA				O								

	Active power consumed											
	Instantaneous				Maximum				Minimum			
	L1 API1	L2 API2	L3 API3	III API	L1 APMX1	L2 APMX2	L3 APMX3	III APMX	L1 APMN1	L2 APMN2	L3 APMN3	III APMN
CIRWATT	X	X	X	X								
CIRWATT B	X	X	X	X								
Computer Smart				X				X				X
CVM 144	X	X	X	X	X	X	X	X	X	X	X	X
CVM 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM B/BD	X	X	X	X								
CVM BC	X	X	X	X	X	X	X	X	X	X	X	X
CVM K	X	X	X	X								
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM SP	X				X				X			
CVM 1D				X				X				X
MK LCD	X				X							
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
POWERNET	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Active power generated											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	NAPI1	NAPI2	NAPI3	NAPI	NAPMX1	NAPMX2	NAPMX3	NAPMX	NAPMN1	NAPMN2	NAPMN3	NAPMN
Computer Smart				X				X				X
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Capacitive power consumed											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	CPI1	CPI2	CPI3	CPI	CPMX1	CPMX2	CPMX3	CPMX	CPMN1	CPMN2	CPMN3	CPMN
CIRWATT	X	X	X	X								
CIRWATT B	X	X	X	X								
Computer Smart				X				X				X
CVM 144	X	X	X	X	X	X	X	X	X	X	X	X
CVM 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM B/BD	X	X	X	X								
CVM BC	X	X	X	X	X	X	X	X	X	X	X	X
CVM K	X	X	X	X								
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM SP	X				X				X			
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
POWERNET	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Capacitive power generated											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	NCP11	NCP12	NCP13	NCP1	NCPMX1	NCPMX2	NCPMX3	NCPMX	NCPMN1	NCPMN2	NCPMN3	NCPMN
Computer Smart				X				X				X
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Inductive power consumed											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	IP11	IP12	IP13	IP1	IPMX1	IPMX2	IPMX3	IPMX	IPMN1	IPMN2	IPMN3	IPMN
CIRWATT	X	X	X	X								
CIRWATT B	X	X	X	X								
Computer Smart				X				X				X
CVM 144	X	X	X	X	X	X	X	X	X	X	X	X
CVM 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM B/BD	X	X	X	X								
CVM BC	X	X	X	X	X	X	X	X	X	X	X	X
CVM K	X	X	X	X								
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM SP	X				X				X			
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
POWERNET	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Inductive power generated											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	NIP11	NIP12	NIP13	NIP1	NIPMX1	NIPMX2	NIPMX3	NIPMX	NIPMN1	NIPMN2	NIPMN3	NIPMN
Computer Smart				X				X				X
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Power consumed factor											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	PF11	PF12	PF13	PF1	PFMX1	PFMX2	PFMX3	PFMX	PFMN1	PFMN2	PFMN3	PFMN
CIRWATT	X	X	X									
CIRWATT B	X	X	X	X								
Computer Smart				X				X				X
CVM 144	X	X	X	X	X	X	X	X	X	X	X	X
CVM 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM B/BD	X	X	X	X								
CVM BC	X	X	X	X	X	X	X	X	X	X	X	X
CVM K	X	X	X	X								
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM SP	X				X				X			
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
POWERNET	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Power generated factor											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	NPF11	NPF12	NPF13	NPF1	NPFMX1	NPFMX2	NPFMX3	NPFMX	NPFMN1	NPFMN2	NPFMN3	NPFMN
Computer Smart				X				X				X
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Cos φ consumed											
	Instantáneas				Máximas				Mínimas			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	COSI1	COSI2	COSI3	COSI	COSMX1	COSMX2	COSMX3	COSMX	COSMN1	COSMN2	COSMN3	COSMN
Computer Smart				X				X				X
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI				X				X				X
CVM NET				X				X				X
CVM NRG 96				X				X				X

	Cos φ generated											
	Instantáneas				Máximas				Mínimas			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	NCOSI1	NCOSI2	NCOSI3	NCOSI	NCOSMX1	NCOSMX2	NCOSMX3	NCOSMX	NCOSMN1	NCOSMN2	NCOSMN3	NCOSMN
Computer Smart				X				X				X
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI				X				X				X
CVM NET				X				X				X
CVM NRG 96				X				X				X

PowerStudio

Active power escale			
Instantánea		Máxima	Mínima
AP_ESCALEI		AP_ESCALEMX	AP_ESCALEMN
Computer Smart	X	X	X

Reactive power escale			
Instantánea		Máxima	Mínima
RP_ESCALEI		RP_ESCALEMX	RP_ESCALEMN
Computer Smart	X	X	X

Apparent power escale			
Instantánea		Máxima	Mínima
VA_ESCALEI		VA_ESCALEMX	VA_ESCALEMN
Computer Smart	X	X	X

2.1.5 Energy

	Apparent energy			
	Consumed		Generated	
	III	Rate y (y:1..9)	III	Rate y (y:1..9)
	VAE	VAETy	NVAE	NVAETy
CVM K2	X	O	X	O
CVM MINI	X		X	
CVM NET	X		X	
CVM NRG 96	X		X	
MP3/MP4	X		X	

	Active energy Consumed								
	L1	L2	L3	III	Partial	Rate y		Contract x (x:1..3)	
	AE1	AE2	AE3	AE	PAE	y:1..3 AETy	y:4..9 AETy	Rate y (y:1..9) AECxTy	Total AECxTOT
CIRWATT	X	X	X	X				X	X
CIRWATT B				X					
CVM 144				X					
CVM 96				X					
CVM B/BD				X		O			
CVM BC				X					
CVM K				O		O			
CVM K2				X		O	O		
CVM MINI				X					
CVM NRG 96				X					
CVM SP				X					
CVM 1D				X	X				
EDMK				X	O				
MK D				X	O	O			
MK LCD				X	X				
MP3/MP4	X	X	X	X					
POWERNET				X					
QNA				O					

	Active energy generated								
	L1	L2	L3	III	Partial	Rate		Contract x (x:1..3)	
	NAE1	NAE2	NAE3	NAE	PNAE	y:1..3 NAETy	y:4..9 NAETy	Rate y (y:1..9) NAECxTy	Total NAECxTOT
CIRWATT	X	X	X	X				X	X
CIRWATT B				X					
CVM B/BD				O		O			
CVM K				O		O			
CVM K2				X		O	O		
CVM MINI				X					
CVM NET				X					
CVM NRG 96				X					
CVM 1D				X	X				
EDMK				O	O				
MK D				O	O	O			
MP3/MP4	X	X	X	X					
QNA				O					

Capacitive energy consumed													
	L1	L2	L3	III	Partial	Rate		2nd quadrant (2Q)					
	CE1	CE2	CE3	CE	PCE	y:1..3	y:4..9	L1	L2	L3	III	Contract x (x:1..3)	
						CETy	CETy	CE2Q1	CE2Q2	CE2Q3	CE2Q	Rate y (y:1..9)	Total
CIRWATT								X	X	X	X	X	X
CIRWATT B											X		
CVM 144				X									
CVM 96				X									
CVM B/BD				X		O							
CVM BC				X									
CVM K				O		O							
CVM K2				X		O	O						
CVM MINI				X									
CVM NET				X									
CVM NRG 96				X									
CVM SP				X									
CVM 1D				X	X								
EDMK				X	O								
MK D				X	O	O							
MP3/MP4	X	X	X	X									
POWERNET				X									
QNA				O									

	Capacitive energy generated										
	III	Partial	Rate		4th quadrant (4Q)						
			y:1..3	y:4..9	L1	L2	L3	III	Contract x (x:1..3)		
		NCE	PNCE	NCETy					NCETy	CE4Q1	CE4Q2
CIRWATT					X	X	X	X	X	X	X
CIRWATT B									X		
CVM B/BD	X		O								
CVM BC	X										
CVM K	O		O								
CVM K2	X		O	O							
CVM MINI	X										
CVM NET	X										
CVM NRG 96	X										
CVM 1D	X	X									
EDMK	O	O									
MK D	O	O	O								
MP3/MP4	X										
QNA	O										

Inductive energy consumed													
	L1	L2	L3	III	Partial	Rate		1st quadrant (1Q)					
	IE1	IE2	IE3	IE	PIE	y:1..3	y:4..9	L1	L2	L3	III	Contract x (x:1..3)	
						IETy	IETy	IE1Q1	IE1Q2	IE1Q3	IE1Q	Rate y (y:1..9)	Total
CIRWATT								X	X	X	X	X	X
CIRWATT B											X		
CVM 144				X									
CVM 96				X									
CVM B/BD				X		O							
CVM BC				X									
CVM K				O		O							
CVM K2				X		O	O						
CVM MINI				X									
CVM NET				X									
CVM NRG 96				X									
CVM SP				X									
CVM 1D				X	X								
EDMK				X	O								
MK D				X	O	O							
MP3/MP4	X	X	X	X									
POWERNET				X									
QNA				O									

	Inductive energy generated									
	III	Partial	Rate		3rd quadrant (3Q)					Contract x (x:1..3)
					L1	L2	L3	III	Rate y (y:1..9)	Total
	NIE	PNIE	y:1..3 NIETy	y:4..9 NIETy	IE3Q1	IE3Q2	IE3Q3	IE3Q	IE3QCxTy	IE3QCxTOT
CIRWATT					X	X	X	X	X	X
CIRWATT B								X		
CVM B/BD	X		O							
CVM BC	X									
CVM K	O		O							
CVM K2	X		O	O						
CVM MINI	X									
CVM NET	X									
CVM NRG 96	X									
CVM 1D	X	X								
EDMK	O	O								
MK D	O	O	O							
MP3/MP4	X									
QNA	O									

All energy variables can be filtered.

2.1.6 Maximum demand

	Maximum demand consumed									
	Instantaneous					Maximum				
	L1	L2	L3	III	Rate y (y:1..3)	L1	L2	L3	III	Rate y (y:1..3)
	MDI1	MDI2	MDI3	MDI	MDITy	MDMX1	MDMX2	MDMX3	MDMX	MDMXTy
CVM 144	O	O	O	O		O	O	O	O	
CVM 96	O	O	O	O		O	O	O	O	
CVM B/BD					O					O
CVM BC	O	O	O	O		O	O	O	O	
CVM K					O					O
CVM MINI	O	O	O	O		O	O	O	O	
CVM NET	O	O	O	O		O	O	O	O	
CVM NRG 96	O	O	O	O		O	O	O	O	
CVM SP	O					O				
CVM 1D				X					X	
MP3/MP4	X	X	X	X		X	X	X	X	
POWERNET	O	O	O	O		O	O	O	O	

	Maximum demand generated									
	Instantaneous					Maximum				
	L1	L2	L3	III	Rate y (y:1..3)	L1	L2	L3	III	Rate y (y:1..3)
	NMDI1	NMDI2	NMDI3	NMDI	NMDITy	NMDMX1	NMDMX2	NMDMX3	NMDMX	NMDMXTy
CVM NET	O	O	O	O		O	O	O	O	
CVM NRG 96	O	O	O	O		O	O	O	O	
MP3/MP4	X	X	X	X		X	X	X	X	

	Maximum demand of apparent power							
	Consumed				Generated			
	Instantaneous		Maximum		Instantaneous		Maximum	
	MDVAI	Rate y (y:1..9)	MDVAMX	Rate y (y:1..9)	NMDVAI	Rate y (y:1..9)	NMDVAMX	Rate y (y:1..9)
	MDVAITy		MDVAMXTy		NMDVAITy		NMDVAMXTy	
CVM K2	X	O	X	O	X	O	X	O

	Maximum demand of active power							
	Consumed				Generated			
	Instantaneous		Maximum		Instantaneous		Maximum	
	MDAPI	Rate y (y:1..9)	MDAPMX	Rate y (y:1..9)	NMDAPI	Rate y (y:1..9)	NMDAPMX	Rate y (y:1..9)
	MDAPITy		MDAPMXTy		NMDAPITy		NMDAPMXTy	
CVM K2	X	O	X	O	X	O	X	O

	Maximum current demand							
	Instantaneous				Maximum			
	L1	L2	L3	III	L1	L2	L3	III
	MDAI1	MDAI2	MDAI3	MDAI	MDAMX1	MDAMX2	MDAMX3	MDAMX
CVM K2	X	X	X	X	X	X	X	X

	Maximum current demand rate y (y:1..9)							
	Instantaneous				Maximum			
	L1	L2	L3	III	L1	L2	L3	III
	MDAI1Ty	MDAI2Ty	MDAI3Ty	MDAITy	MDAMX1Ty	MDAMX2Ty	MDAMX3Ty	MDAMXTy
CVM K2	O	O	O	O	O	O	O	O

All maximum demand variables can be filtered.

2.1.7 Harmonics

	Voltage harmonics	
	Instantaneous	Maximum
	ARMxV	ARMxVMX
	X: (3, 5, 7, 9, 11, 13)	X: (3, 5, 7, 9, 11, 13)

	Voltage harmonics							
	L1		L2		L3		Neutral	
	x:1..15	x:16..50	x:1..15	x:16..50	x:1..15	x:16..50	x:1..15	x:16..50
	ARMxV1		ARMxV2		ARMxV3		ARMxVN	
CVM K2	X	X	X	X	X	X	X	X
CVM K HAR	X	X	X	X	X	X		
CVM MINI	X		X		X			
CVM NET	X		X		X			
CVM NRG 96	X		X		X			
QNA	O	O	O	O	O	O		

	Current harmonics	
	Instantaneous	Maximum
	ARMxA	ARMxAMX
	X: (3, 5, 7, 9, 11, 13)	X: (3, 5, 7, 9, 11, 13)

	Current harmonics											
	L1			L2			L3			Neutral		
	x:1..15	x:16..31	x:32..50	x:1..15	x:16..31	x:32..50	x:1..15	x:16..31	x:32..50	x:1..15	x:16..31	x:32..50
	ARMxA1			ARMxA2			ARMxA3			ARMxAN		
CVM 144	O			O			O					
CVM 96	O	O		O	O		O	O				
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM K HAR	X	X	X	X	X	X	X	X	X			
CVM MINI	X			X			X					
CVM NET	X			X			X					
CVM NRG 96	X			X			X					
QNA	O	O	O	O	O	O	O	O	O			

	Maximum voltage harmonics (3 sec.)		
	L1	L2	L3
	ARMMyXCV1 (y:1..50)	ARMMyXCV2 (y:1..50)	ARMMyXCV3 (y:1..50)
	O	O	O

	Maximum voltage harmonics (10 mins.)		
	L1	L2	L3
	ARMMyXPV1 (y:1..50)	ARMMyXPV2 (y:1..50)	ARMMyXPV3 (y:1..50)
	O	O	O

2.1.8 Pst / Plt

	Pst		
	L1	L2	L3
	PST1	PST2	PST3
CVM K2	0	0	0
QNA	0	0	0

	Pst – Upper percentile [95%]					
	All registers			Valid registers		
	L1	L2	L3	L1	L2	L3
	PST1SUPT	PST2SUPT	PST3SUPT	PST1SUPV	PST2SUPV	PST3SUPV
QNA	0	0	0	0	0	0

	Pst – Input x (x:1..20)		
	L1	L2	L3
	PST1Dix	PST2Dix	PST3Dix
QNA	0	0	0

	Plt		
	L1	L2	L3
	PLT1	PLT2	PLT3
CVM K2	0	0	0
QNA	0	0	0

	Plt – Upper percentile [95%]					
	All registers			Valid registers		
	L1	L2	L3	L1	L2	L3
	PLT1SUPT	PLT2SUPT	PLT3SUPT	PLT1SUPV	PLT2SUPV	PLT3SUPV
QNA	0	0	0	0	0	0

2.1.9 Inputs and Outputs

	Digital inputs			
	x:1..4	x:4..18	x:19..24	x:25..50
	DIx			
CIRWATTB	O			
CVM 144	O			
CVM K2	O	O	O	
CVM R8	O	O		
EDS	X	X: (5..8)		
EDS Embedded	X	X: (5..8)		
LM 24	X	X	X	
LM-4 A	X (x:1, 2)			
LM50	X	X	X	X
LM50 Plus	X	X	X	X
MR4	X	X		
TCP50 ALARM	X	X	X	X

	Analogue inputs	
	X (1..4)	
	AIx	
LM-4 A	X	

	Analogue inputs											
	Instantaneous				Maximum				Minimum			
	x:1..1	x:2..3	x:4..8	x:9..24	x:1..1	x:2..3	x:4..8	x:9..24	x:1..1	x:2..3	x:4..8	x:9..24
	Allx				AIMXx				AIMNx			
CVM 144	O	O			O	O			O	O		
CVM K2	O	O	O	O								
CVM R8	O	O	O		O	O	O		O	O	O	
CVM MINI	X				X				X			
MP3/MP4	X				X				X			

The analogue input of the MP3/MP4 and CVM-MINI devices will correspond to the temperature variable measured by this type of device.

	Digital outputs						
	1	2	3	4	x:5..18	x:19..20	x:21..24
	DO1	DO2	DO3	DO4	DOx		
CIRWATT	X	X	X	X			
CIRWATT B	X	X	X	X			
CVM 144	O	O					
CVM 96	O	O					
CVM BC	O	O					
CVM K2	O	O	O	O	O	O	O
CVM R8	O	O	O	O	O		
CVM MINI	X	X					
CVM NET	X	X					
CVM NRG 96	X						
CVM SP	O	O					
EDMK	O	O					
EDS	X	X	X	X	X: (5..8)		
EDS Embedded	X	X	X	X	X: (5..6)		
LM-4 A	X	X					
MK LCD	X						
MP3/MP4	X	X					
MR4	X	X	X	X			
QNA	O	O	O	O	O	O	

Digital outputs may be forced to 0 (the output will remain open) or to 1 (the output will close).

2.1.10 Counters

	Counter	
	x:1..24	x:25..50
	Cx	
CIRWATTB	O: (1..4)	
CVM K2	O	
EDS	X: (1..8)	
EDS Embedded	X: (1..8)	
LM 24	X	
LM-4 A	X (x: 1, 2)	
LM50	X	X
LM50 Plus	X	X

The values of the counters on the LM50 devices may be forced between 0 and the maximum value permitted by the device. See the device manual for more details on this maximum value.

All counter variables can be filtered.

2.1.11 Special device variables

2.1.11.1 AFQ

	Net			Load		
	L1	L2	L3	L1	L2	L3
Active power	API1N	API2N	API3N	API1L	API2L	API3L
Reactive power	RPI1N	RPI2N	RPI3N	RPI1L	RPI2L	RPI3L
Apparent power	VAI1N	VAI2N	VAI3N	VAI1L	VAI2L	VAI3L
Power factor	PFI1N	PFI2N	PFI3N	PFI1L	PFI2L	PFI3L

	Current harmonics					
	Net			Load		
	L1	L2	L3	L1	L2	L3
Fundamental	ARM1A1N	ARM1A2N	ARM1A3N	ARM1A1L	ARM1A2L	ARM1A3L
Harmonic 3	ARM3A1N	ARM3A2N	ARM3A3N	ARM3A1L	ARM3A2L	ARM3A3L
Harmonic 5	ARM5A1N	ARM5A2N	ARM5A3N	ARM5A1L	ARM5A2L	ARM5A3L
Harmonic 7	ARM7A1N	ARM7A2N	ARM7A3N	ARM7A1L	ARM7A2L	ARM7A3L
Harmonic 9	ARM9A1N	ARM9A2N	ARM9A3N	ARM9A1L	ARM9A2L	ARM9A3L
Harmonic 11	ARM11A1N	ARM11A2N	ARM11A3N	ARM11A1L	ARM11A2L	ARM11A3L
Harmonic 13	ARM13A1N	ARM13A2N	ARM13A3N	ARM13A1L	ARM13A2L	ARM13A3L
Harmonic 15	ARM15A1N	ARM15A2N	ARM15A3N	ARM15A1L	ARM15A2L	ARM15A3L
Harmonic 17	ARM17A1N	ARM17A2N	ARM17A3N	ARM17A1L	ARM17A2L	ARM17A3L
Harmonic 19	ARM19A1N	ARM19A2N	ARM19A3N	ARM19A1L	ARM19A2L	ARM19A3L
Harmonic 21	ARM21A1N	ARM21A2N	ARM21A3N	ARM21A1L	ARM21A2L	ARM21A3L
Harmonic 23	ARM23A1N	ARM23A2N	ARM23A3N	ARM23A1L	ARM23A2L	ARM23A3L
Harmonic 25	ARM25A1N	ARM25A2N	ARM25A3N	ARM25A1L	ARM25A2L	ARM25A3L

2.1.11.2 C-14d

	Current	Current distortion	Cos ϕ	Active Quadrant	Alarm active	Digital output	
	AI	DAI	COSI	QUADRANT	ALARM	Alarm	x:1..14
C-14d	X	X	X	X	X	X	X

Active Quadrant	Value
Energy consumed	0
Energy consumed. Capacitive system	1
Energy consumed. Inductive system	2
Energy generated	4
Energy generated. Capacitive system	5
Energy generated. Inductive system	6

Alarm active	Value
None	0
Compensation alarm (-CE)	1
Overcurrent alarm (-AE)	2
Distortion alarm (-dE)	3
Setup error alarm	4
Expansion card communication alarm	5
Referenced voltage error alarm	6

Alarm digital output	Value
Not enabled	0
Enabled	1

2.1.11.3 CBS-4

	Differential current		Status		
	Instantaneous	Detected	Of the channel	Of the protection	Pre-alarm relay
	Channel x (x:1..4)				
	AELIx	AELDx	STx	DOx	
	CBS-4	X	X	X	X

Channel status	Value
Not Triggered	0
Differential current exceeded	1
Toroid error	2

Protection status	Value
Not enabled	0
Enabled	1

Pre-alarm relay status	Value
Not enabled	0
Enabled	1

On CBS-4 devices we can reset the x channel forcing the status variable of the RSTx to value 0 or remotely trigger the channel forcing the variable to 1.

2.1.11.4 CBS-8, CDR-8

	Differential current		Status		
	Instantaneous	Detected	Of the channel	Of the protection	Pre-alarm relay
	Canal x (x:1..8)				
	AELIx	AELDx	STx	DOx	
CBS-8	X	X	X	X	X
CDR-8	X	X	X	X	X

Status of the channel output	Value
Not Triggered	0
Differential current exceeded	1
Output triggered	2
Output locked	3

Pre-alarm relay status	Value
Not enabled	0
Enabled	1

On CBS-8 and CDR-8 devices we can reset the x channel forcing the status variable of the (STx) to value 16.

We can also remotely trigger the x channel forcing the RFCx variable to 1 to activate remote triggering or 0 to deactivate it.

2.1.11.5 CCL

	Plug x (x:1..6)
Total active energy	AEx
Partial active energy	AEPx
Active power	APIx
Digital output	DOx
Car connected	CCx
Digital input	AUXx
Bollard state	STATEx
Identifier	TAGx

2.1.11.6 CIRWATT

The following show the specific variables of the CIRWATT devices, the shared variables, such as voltage and current, are included in the corresponding variable table.

Billing closures – absolute energy						
Contract x (x: 1..3)						
Rate y (y:1..9)			Total			
Active	Inductive	Capacitive	Active	Inductive	Capacitive	
AEABSCxTy	IEABSCxTy	CEABSCxTy	AEABSCxTOT	IEABSCxTOT	CEABSCxTOT	
CIRWATT	X	X	X	X	X	X

Billing closures – Incremental energy						
Contract x (x: 1..3)						
Rate y (y:1..9)			Total			
Active	Inductive	Capacitive	Active	Inductive	Capacitive	
AEINCCxTy	IEINCCxTy	CEINCCxTy	AEINCCxTOT	IEINCCxTOT	CEINCCxTOT	
CIRWATT	X	X	X	X	X	X

Billing closures – Power						
Contract x (x: 1..3)						
Rate y (y:1..9)			Total			
Maximum demand	Power excesses	Power factor	Maximum demand	Power excesses	Power factor	
MDCxTy	EXCCxTy	PFCxTy	MDCxTOT	EXCCxTOT	FPCxTOT	
CIRWATT	X	X	X	X	X	X

The power factor variable is calculated by the software using active and inductive energy.

Power		
Contract x (x: 1..3) Rate y (y: 1..9)		
Contracted	Excesses by register	
CPWCxTy	REXCCxTy	
CIRWATT	X	X

Power Excesses are calculated by the software for each curve register downloaded onto CIRWATT equipment.

2.1.11.7 COMPUTER SMART

Temperature		
Instantaneous	Maximum	Minimum
AI1	AIMX	AIMN
Computer Smart	X	X

Capacitor	
Number of x capacitor connexions	
X (1..12)	
Computer Smart	NCCx

2.1.11.8 CVM-K2

The following shows the specific variables of the CVM-K2 devices, the shared variables, such as voltage and current, are included in the corresponding variable table.

Coefficient K _d

PowerStudio

	Voltage			Current		
	Instantaneous	Maximum	Minimum	Instantaneous	Maximum	Minimum
	KDVI	KDVMX	KDVMN	KDAI	KDAMX	KDAMN
CVM K2	X	X	X	X	X	X

	Coefficient K _a					
	Voltage			Current		
	Instantaneous	Maximum	Minimum	Instantaneous	Maximum	Minimum
	KAVI	KAVMX	KAVMN	KAAI	KAAMX	KAAMN
CVM K2	X	X	X	X	X	X

	Temperature		
	Instantaneous	Maximum	Minimum
	TI	TMX	TMN
CVM K2	X	X	X

	K Factor								
	Instantaneous			Maximum			Minimum		
	L1	L2	L3	L1	L2	L3	L1	L2	L3
	KFAI1	KFAI2	KFAI3	KFAMX1	KFAMX2	KFAMX3	KFAMN1	KFAMN2	KFAMN3
CVM K2	X	X	X	X	X	X	X	X	X

	Crest factor								
	Instantaneous			Maximum			Minimum		
	L1	L2	L3	L1	L2	L3	L1	L2	L3
	CFVI1	CFVI2	CFVI3	CFVMX1	CFVMX2	CFVMX3	CFVMN1	CFVMN2	CFVMN3
CVM K2	X	X	X	X	X	X	X	X	X

	Weighted Flicker		
	L1	L2	L3
	FWA1	FWA2	FWA3
CVM K2	X	X	X

2.1.11.9 DH-96

	Voltage			Current			Active power			Active energy
	Inst.	Max.	Min.	Inst.	Max.	Min.	Inst.	Max.	Min.	
	VI	VMX	VMN	AI	AMX	AMN	API	APMX	APMN	
DH-96 CPM	X	X	X	X	X	X	X	X	X	X

	Measured	Peak	Off-peak	Counter	Flow
	ME	PK	VL	C1	F1
DH-96 AC	X	X	X		
DH-96 CT				X	O
DH-96 DC	X	X	X		
DH-96 FT	X	X	X		
DH-96 SG	X	X	X		
DH-96 TMP	X	X	X		
DH-96 WG	X	X	X		

	Active power			Digital outputs				Active energy
	Inst.	Max.	Avg.	DO1	DO2	DO3	DO4	
	API	APMX	APAVG					
DH-96 CPP	X	X	X	X	X	X	X	X

2.1.11.10 EDS

	Flow
	x: 1..8
	Fx
	X
EDS	

2.1.11.11 MK D

	Active rate	Digital input		Counters		Digital output	
	ACTTARIFF	DI1	DI2	C1	C2	DO1	DO2
MK D	O	O	O	O	O	O	O

2.1.11.12 MP3 / MP4

	Instantaneous	Maximum	Minimum
Temperature	AI1	AIMX1	AIMN1

2.1.11.13 QNA

The following shows the specific variables of the QNA devices, the shared variables, such as voltage and current, have been included in the corresponding variable table.

	Event alarms								
	Power cut			Gap			Overvoltage		
	L1	L2	L3	L1	L2	L3	L1	L2	L3
	ALEVEI1	ALEVEI2	ALEVEI3	ALEVES1	ALEVES2	ALEVES3	ALEVEO1	ALEVEO2	ALEVEO3
QNA	X	X	X	X	X	X	X	X	X

Alarm event variables will activate (value 1) when an event is produced in the QNA and will remain active for 5 seconds. When these 5 seconds have elapsed without any new event taking place, the alarm will deactivate (value 0).

	Voltage phasor		Voltage-current phasor		
	L1-L2	L1-L3	L1	L2	L3
	FDV12	FDV13	FDV1	FDV2	FDV3
QNA	O	O	O	O	O

	Counter of number of 10 cycle blocks					
	With EVQ			With voltage off limits		
	L1	L2	L3	L1	L2	L3
	STCBE1	STCBE2	STCBE3	STCVB1	STCVB2	STCVB3
QNA	X	X	X	X	X	X

Counter of 150 cycle integrations						
Of all STD parameters except voltage				Voltage		
L1	L2	L3	L1	L2	L3	
STCIS1	STCIS2	STCIS3	STCIV1	STCIV2	STCIV3	
QNA	X	X	X	X	X	X

Coefficient K _d			Coefficient K _a	
Voltage	Current		Voltage	Current
KDV	KDA		KAV	KAA
QNA	O		O	O

Imbalance-percentile higher than 95%			
All registers		Valid registers	
UBSUPT		UBSUPV	
QNA		O	

Total no. of registers	Registers without events	Value counters					
		Frequency	Frequency without events	Plt	Plt without events		
					L1	L2	L3
NREGTOT	NREGEVQ	CVHZ	CVHZEVSQ	CVPLT	CVPLT1EVQ	CVPLT2EVQ	CVPLT3EVQ
QNA	O	O	O	O	O	O	O

Event log			
L1	L2	L3	
HEVQ1	HEVQ2	HEVQ3	
QNA	X	X	X

2.1.11.14 RGU-10 / RGU-10 RA

RMS value		Status			
Differential current	Differential current trigger	Pre-alarm trigger	Locking	Coil triggering	Device
AELI	AELD	DO0		DO1	ST
RGU-10	X	X		X	
RGU-10 RA	X		X		X

No. reconnection			
Differential		Circuit breaker	
Partial	Total	Partial	Total
RCPD	RCTD	RCPM	RCTM
RGU-10 RA	X	X	X

Pre-alarm trigger output status	Value
Not enabled	0
Enabled	1

Locking output status	Value
Not locked	0
Locked	1

Coil trigger output status	Value
Not Tripped	0
Tripped	1

Status of the device	Value
Start	0
Rest	1
Earth differential trigger locking	2
Earth differential trigger waiting	3
Circuit breaking trigger locking	4
Circuit breaking trigger waiting	5
Toroid disconnected	6
External input enabled	7
Remote trigger	8
Test trigger	9
Manufacturing mode	10
Calibration mode	11

0. To carry out a channel reset on the RGU-10 devices the RST variable must be forced to value 0.
1. To carry out a remote triggering of the channel the RST variable should be forced to the value 1.

2.1.11.15 RRM-C

	Reconnection counter	No. of reconnections selected	Time between reconnections	Device status
	RC	RN	RT	ST
RRM-C	X	X	X	X

Device status	Value
Unknown	65535
Connected	0
Locked	1
External trigger	2
Residual current device trigger	4
Communication trigger	8
External and communication trigger	10

On RRM-C devices the device status can be forced to 16 to reset it, or to 17 trigger the device externally.

2.1.11.16 TAGREADER

Tag	TAG
Time	TIME

2.1.11.17 TH-DG-RS485

The following show temperature, dew point and humidity variables:

	Temperature °C			Temperature °F		
	Inst.	Max.	Min.	Inst.	Max.	Min.
TH-DG-RS485	TCI	TCMX	TCMN	TFI	TFMX	TFMN

	Relative humidity %			Absolute humidity g/m ³		
	Inst.	Max.	Min.	Inst.	Max.	Min.
TH-DG-RS485	RHI	RHMX	RHMN	AHI	AHMX	AHMN

	Dew point °C			Dew point °F		
	Inst.	Max.	Min.	Inst.	Max.	Min.
TH-DG-RS485	DPCI	DPCMX	DPCMN	DPFI	DPFMX	DPFMN

2.1.11.18 TR8

The variables of the master module and slave modules of the TR8 device are shown below.

	Master		
	Current y (y:1..8)	Voltage	Digital inputs y (y:1..8)
	Aly	VI	Dly
TR8	X	X	X

	Slaves		
	Module xx (xx: 01..31)		
	Current y (y:1..8)	Voltage	Digital inputs y (y:1..8)
	MxxAly	MxxVI	MxxDly
TR8	X	X	X

2.1.11.19 TR16

The variables of the master module and slave modules of the TR16 device are shown below.

	Master				
	Current y (y:1..16)	Voltage	Temperature	Analog input 1	Digital inputs y (y:1..3)
	Aly	VI	TI	All	Dly
TR16	X	X	X	X	X

	Slaves					
	Module xx (xx:1..15)					
	Current (y:1..16)	Voltage	Temperature	Analog input 1	Digital input y (y:1..3)	Current trigger threshold
	MOxxAly	MOxxVI	MOxxTI	MOxxAll	MOxxDly	MOxxMAT
TR16	X	X	X	X	X	X

2.1.11.20 X2

	Plug 1	Plug 2
Total active energy	AE1	AE2
Partial active energy	AEP1	AEP2
Active power	API1	API2
Digital output	DO1	DO2
Digital input	DI1	
Euros / kWh	EKWH1	EKWH2
Identifier	TAG1	TAG2
Bollard state	STATE1	STATE2

2.1.12 Graph variables and special tables

Special variables for graphs and tables serve to indicate to PowerStudio that a graph or non-standard table is desired. On a non-standard graph or table the values that appear in the X and Y axis, rows and columns on a table, may switch from one type to another, depending on the variables represented. For a better understanding of these graphs and tables see the section on the java client.

When you want to make special graphs or tables, such as the waveform or harmonics, it will be necessary to use the following variables.

	Waveform					
	Voltage:			Current		
	L1	L2	L3	L1	L2	L3
	FOV1	FOV2	FOV3	FOA1	FOA2	FOA3
QNA	O	O	O	O	O	O

	Harmonics							
	Voltage				Current			
	L1	L2	L3	Neutral	L1	L2	L3	Neutral
	ARMV1	ARMV2	ARMV3	ARMVN	ARMA1	ARMA2	ARMA3	ARMVN
CVM 144					O	O	O	
CVM 96					O	O	O	
CVM K2	X	X	X	X	X	X	X	X
CVM K HAR	X	X	X		X	X	X	
CVM MINI	X	X	X		X	X	X	
CVM NET	X	X	X		X	X	X	
CVM NRG 96	X	X	X		X	X	X	
QNA	O	O	O		O	O	O	

	Maximum voltage harmonics (3 sec.)		
	L1	L2	L3
	ARMMXCV1	ARMMXCV2	ARMMXCV3
QNA	O	O	O

Maximum voltage harmonics (10 mins.)

	L1	L2	L3
	ARMMXPV1	ARMMXPV2	ARMMXPV3
QNA	0	0	0

	Events					
	Duration			effective semi-circle voltage		
	L1	L2	L3	L1	L2	L3
	DEVQ1	DEVQ2	DEVQ3	VEVQ1	VEVQ2	VEVQ3
QNA	X	X	X	X	X	X

	Billing closures
	TCLW
CIRWATT	X

2.1.13 Device status

Sometimes it will be necessary to know the status of a device, for example when you want to activate an event when a device stops communicating. Use the STATUS variable to determine device status.

name. STATUS

The following are the possible values.

<i>Device status</i>	<i>Value</i>
The device is working properly.	1
Device not initialized, initial communication with the device has not been established.	4
Downloading data with ZModem	17
The communication port is incorrect or nonexistent.	18
Camera is working and downloading images by streaming	33
Communication errors.	34
Camera is working but not downloading images by streaming	65
The type of device you are trying to communicate with is different to the specified device.	66
Downloading files from device.	129
The device communicates correctly, but it detects that some of the phases are poorly connected.	130
The version of the device is incompatible with the software.	258
The SD Memory Card is invalid, write-protected or not present.	514

2.1.14 Event Variables¹¹

The event variables will be coded for use in formulas and expressions such as

R\$EVE_variable.name

Using the *R\$EVE* prefix tells the program this is an event variable rather than a device variable.

The following is a table with the different variables associated with each event

Identifier	Description
ST	Event status (0:disabled, 1:Enabled)
TACT	Time the event has been active, the value is 0 when the event is disabled
CACT ¹	Counter of the number of activations
CDIS ¹	Counter of the number of deactivations
CACK ^{1 2}	Counter of the number of recognitions
CTIM ¹	% Of consultation period time that the incident is enabled

¹ Only if the event is recorded in a file

² Only if the incident is reported

¹¹ Only in SCADA and Deluxe versions

Technical Service

For questions, contact CIRCUTOR's Technical Service or your nearest CIRCUTOR distributor.

CIRCUTOR, S.A. – Technical Departament

Vial Sant Jordi s/n

08232 – Viladecavalls

(Barcelona) Spain

Fax. +34 93 745 29 14

E-mail: software@circutor.com

For software actualization please view CIRCUTOR's web page:

Web: www.circutor.com